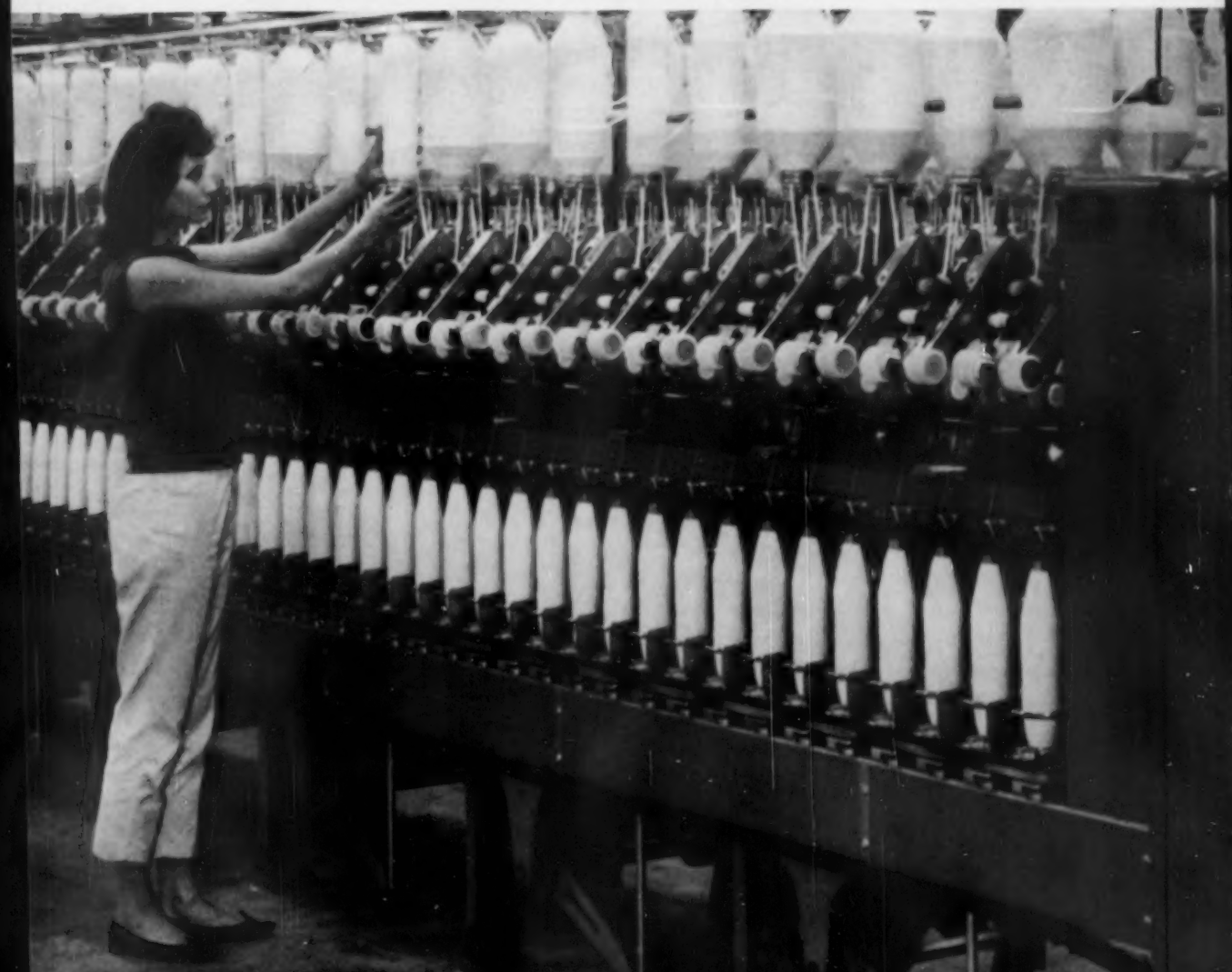
Textile World

JUNE
1960

PRICE
$1.00



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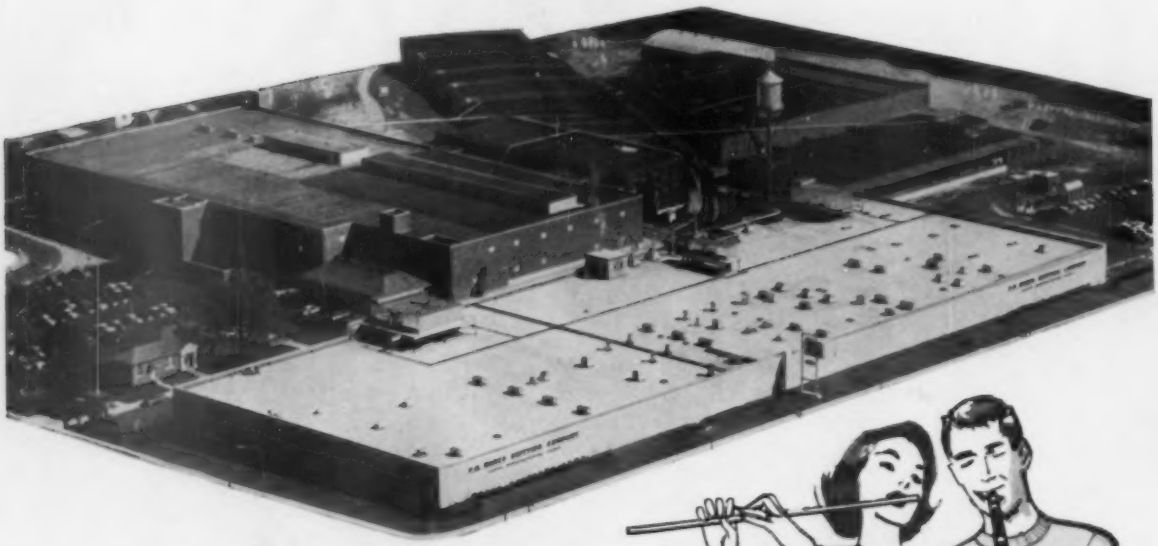
NEW WINSTON SALEM PLANT

PRODUCES FABRICS FOR HANES *Knitwear for the family*



When the P. H. Hanes Knitting Company faced the problem of increasing production to meet the growing demand for their "Knitwear for the Family," Robert and Company Associates were called on to make a thorough study of Hanes' present facilities. Finding existing facilities inadequate for additional production, a new plant adjacent to Hanes' yarn mill in Winston-Salem was recommended.

This modern, 126,000 square foot plant, complete with power plant, central station humidification and air conditioned offices is intregrated with the existing yarn mill. The combined operation includes facilities for spinning, winding, yarn storage and conditioning, knitting, cloth storage, bleaching, dyeing, finishing and shipping.

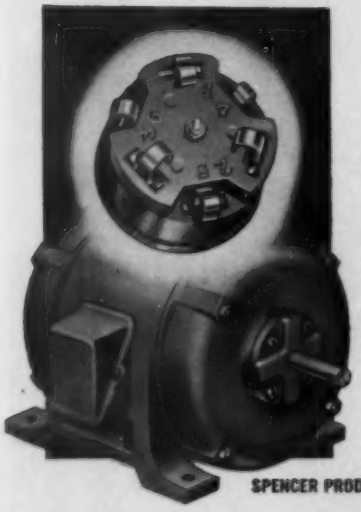
If your plans call for increased productivity and efficiency, draw on Robert and Company Associates' 42 years of experience in serving the great names of the textile industry.

ROBERT AND COMPANY ASSOCIATES
Textile Engineering Division
ATLANTA

HUNTING

for a Solution to STOP MOTOR BURNOUTS

Specify and use 3-phase motors with built-in KLIXON PROTECTORS



SPENCER PRODUCTS

RESULT . . . ● *Eliminate Motor Burnouts* ● *Get Maximum Motor Output* ● *Reduce Costly Equipment Down Time*

No matter what the motor application . . . whether it be textile looms or turret lathes . . . ventilating fans or rolling mills . . . built-in KLIXON Protectors keep motors from burning out under all conditions that cause overheating.

Built-in by the motor manufacturer, as an inherent part, KLIXON Protectors are matched to the thermal characteristics of the motor providing a tested and proven combination to assure full protection. KLIXON Protectors safeguard motors and prevent burnouts caused by the following conditions . . . prolonged overloads, unbalanced voltage, stalling, failure to start, increased ambient temperatures, lack of ventilation, plugging,or reversing duty, and single phasing.

And remember, get the same complete protection in your single phase motors, too.

KLIXON protected motors are available from your motor supplier. The additional cost is low, the savings great. Ask your motor supplier for KLIXON protected motors.

Write for a free copy of Bulletin PR-1243. It gives the complete story.

TEXAS INSTRUMENTS
INCORPORATED
METALS & CONTROLS DIVISION
5506 FOREST STREET • ATTLEBORO, MASS.

SPENCER PRODUCTS: Klixon® Inherent Overheat Motor Protectors • Motor Starting Relays • Thermostats • Precision Switches • Circuit Breakers

PosiWate

- All three top rolls are ball bearing
- Each roll has two widely spaced ball bearings
- Ball bearings are lint sealed and shielded
- Makes increased weight possible
- Front and back top rolls interchangeable
- Positive weighting and weight distribution
- Same weighting spindle to spindle
- Dead weighting or new cartridge weighting
- Rugged arm pivots on back bar rod
- Exclusive cradle support protects aprons
- Cap bars completely eliminated
- Proper top roll alignment
- Eliminates top arm springs and small parts
- Cots revolve together for easy lap removal
- Standard buffing provides .001 accuracy
- Easy cleaning on roll scouring cycles

A 160,000 spindle mill thoroughly tested virtually all modern drafting systems for a six month period with positive results. Roberts Double Apron Drafting with **PosiWate** Top Roll Suspension produced yarn with the fewest ends down, best breaking strength and evenness. Besides, it was the best liked by the spinners themselves.

Roberts Double Apron Drafting is making quality yarn on more than 3½-million spindles. **PosiWate** Top Roll Suspension has been installed on more than 200,000 spindles in the past year and is being installed as a changeover for more than 30 frames every week.

ROBERTS

PosiWate TOP ROLL SUSPENSION

ROBERTS COMPANY
SANFORD, NORTH CAROLINA

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450 Seventh Avenue, New York 1, New York
ROBERTS COMPANY DE MEXICO, S. A.
Avenida Reforma 915-A; Puebla, Pue.; Mexico
HOWARD-ROBERTS COMPANY, LTD.
Burton-On-Trent, Staffordshire, England

MORE THAN 3½ MILLION SPINDLES NOW EQUIPPED WITH ROBERTS HIGH DRAFT

ROBERTS SPINNING NEWS

PUBLISHED BY ROBERTS COMPANY SANFORD, NORTH CAROLINA

SANFORD, NORTH CAROLINA, U. S. A. 1960

Roberts enters new textile machinery field

Adds Worsted Preparatory Equipment to Line of Spinning Frames

Roberts-Tematex ParaBlender with individual ball delivery.

Three new worsted system preparatory machines of latest design and technological improvement — ParaDrafters, AutoEveners, and ParaBlenders —have been added to the Roberts Company line under the name Roberts-Tematex.

They are used in yarn spinning mills as well as in combing and top making plants to pin, parallelize, draft, and blend worsted and other long staple fibers in operations that precede roving and spinning.

Roberts-Tematex machines are considerably more rugged than other machines which are available, hold their settings well and provide high production performance.

The *ParaDrafter* parallelizes and drafts the fibers and can be combined with the *AutoEvener* which automatically evens the weight of the delivered sliver through electronic and mechanical means to within ±1%, from an entering weight variation of up to ±20%.

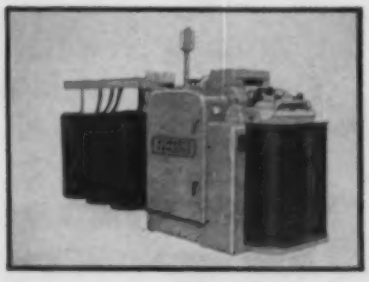
ParaBlenders also parallelize and draft but in combination with a blending operation that provides many doublings and sandwich blends the fibers.

ROBERTS-TEMATEX PARADRAFTER • 8" wide pinning field, 88 fallers per head, flat pins • Three thread faller screws • Fallers .238" thick, pitch .354", 1200 drops per minute • Entering sliver up to 3500 grains per yard • Draft ratios 5 to 15 • Net production delivery up to 270 pounds per hour • Creels for up to 12 cans or balls or combination of cans and balls • Delivery to cans 15" x 36" up to 24" x 48" • Delivery to balls up to 24" diameter x 18" wide (26 pounds) • Hydraulic weighting of the delivery rolls • Hydraulic lifting of head for inspection • Shock absorbers for faller drops • Gradual introduction of fallers into sliver • Automatic stop motions with indicator board to show location of stoppage • Central lubrication • Simple changing of draft and pressures • Static eliminator • With single, bicoil, dual or quad delivery

ROBERTS-TEMATEX AUTOEVENER • Automatic and instantaneous correction of sliver weight • Corrects entering sliver with plus or minus 20% variation • Corrects delivered sliver weight to plus or minus 1% • Mechanical-electrical operation of the measuring, delay and variation units • Fitted only to single head, single delivery ParaDrafter • All ParaDrafter technical details apply

ROBERTS-TEMATEX PARABLENDER • All ParaDrafter technical details as above apply • Melange blending of a high number of slivers • Net Production 400 to 500 pounds per hour • Combines two ParaDrafter heads • Individual ball delivery for each head so machine can be used as two parallel ParaDrafters • Arrangement for combining and sandwich blending finished slivers onto a center ball delivery • Pressure spray oiling for center ball

PARADRAFTER arranged for can feed and dual delivery.



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Textile World

VOLUME 110, NO. 6 JUNE, 1960

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Postmaster . . . Please send form 3579 to Textile World, 330 W. 42nd St., New York 36, N. Y.

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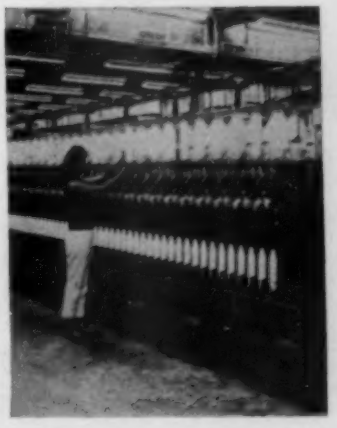
The young lady in the cover photo is at work on just one of Federal Spinning Corp.'s pieces of new equipment. Federal's blue-ribbon array of new equipment fits in perfectly with its spacious, bright, up-to-date mill in Sanford, N. C. Just a year ago, the mill was only a plan. Today, high-quality yarn rolls out of the mill at the rate of two million pounds a year. How was it possible to move so quickly? What did management have to do to insure top-quality production at the best possible cost? You'll get complete answers starting on p. 30.



TEXTILE WORLD, Henry G. Lord founder. Published monthly with an additional issue in July, by McGraw-Hill Publishing Co., Inc. PUBLICATION OFFICE: 99-129 North Broadway, Albany 1, N. Y. See panel below for directions regarding subscriptions or changes of address. EXECUTIVE, SUBSCRIPTION, AND ADVERTISING OFFICES: 330 West 42nd Street, New York 36, N. Y. EDITORIAL OFFICES: 330 West 42nd Street, New York 36, N. Y. and 201 East Coffee Street, Greenville, S. C.

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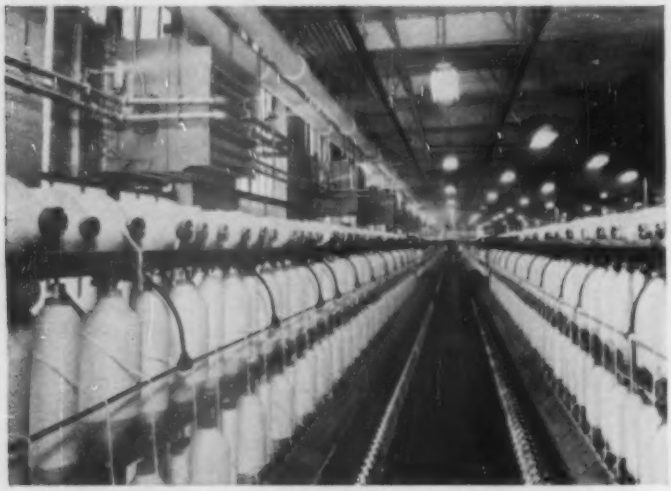
Address correspondence and change of address to Fulfillment Manager, TEXTILE WORLD, 330 West 42nd Street, New York 36, N. Y. When address is changed, subscribers should give old as well as new address, including postal zone number. Enclose recent address label if possible. Allow one month for change to become effective.

Amco Central Station Air Conditioning, using cold water for cooling in warm weather, maintains the proper humidity and temperature conditions year 'round in the above spinning room.



Amco ductless system of humidification, cooling and ventilating installed in a spinning room. Window units and Amco #6 atomizers visible at left, supply properly conditioned air.

Where straight humidification is desired. Amco #6 atomizers — operated with sensitive Amco humidity controls — provide just the right degree of relative humidity for blending, opening and picking operations.

Look to Amco for help in solving any air conditioning problem you may have

Most mill owners face a variety of air conditioning problems. All areas of the three mills illustrated here, for example, required different and distinct types of air conditioning. Amco helped solve these needs by the installation of the proper Amco system, suited to the individual requirements. The results have been better quality, greater worker comfort, and improved efficiency.

Do you have an air treatment problem in your mill? Choose from these systems, used by leading mills, to provide central station air conditioning in one area, humidification alone in another, or a unit ductless evaporative cooling system in still another. Amco, of course, also installs unit dry duct systems.

Whatever your needs, remember . . . you can depend on Amco to give you reliable advice and an expert installation of the system best suited to your particular case.

AMCO

SINCE 1888

AIR CONDITIONING EQUIPMENT

American Moistening Company • Cleveland, North Carolina
Branches: Atlanta, Ga. • Providence, R. I.
Toronto, Canada

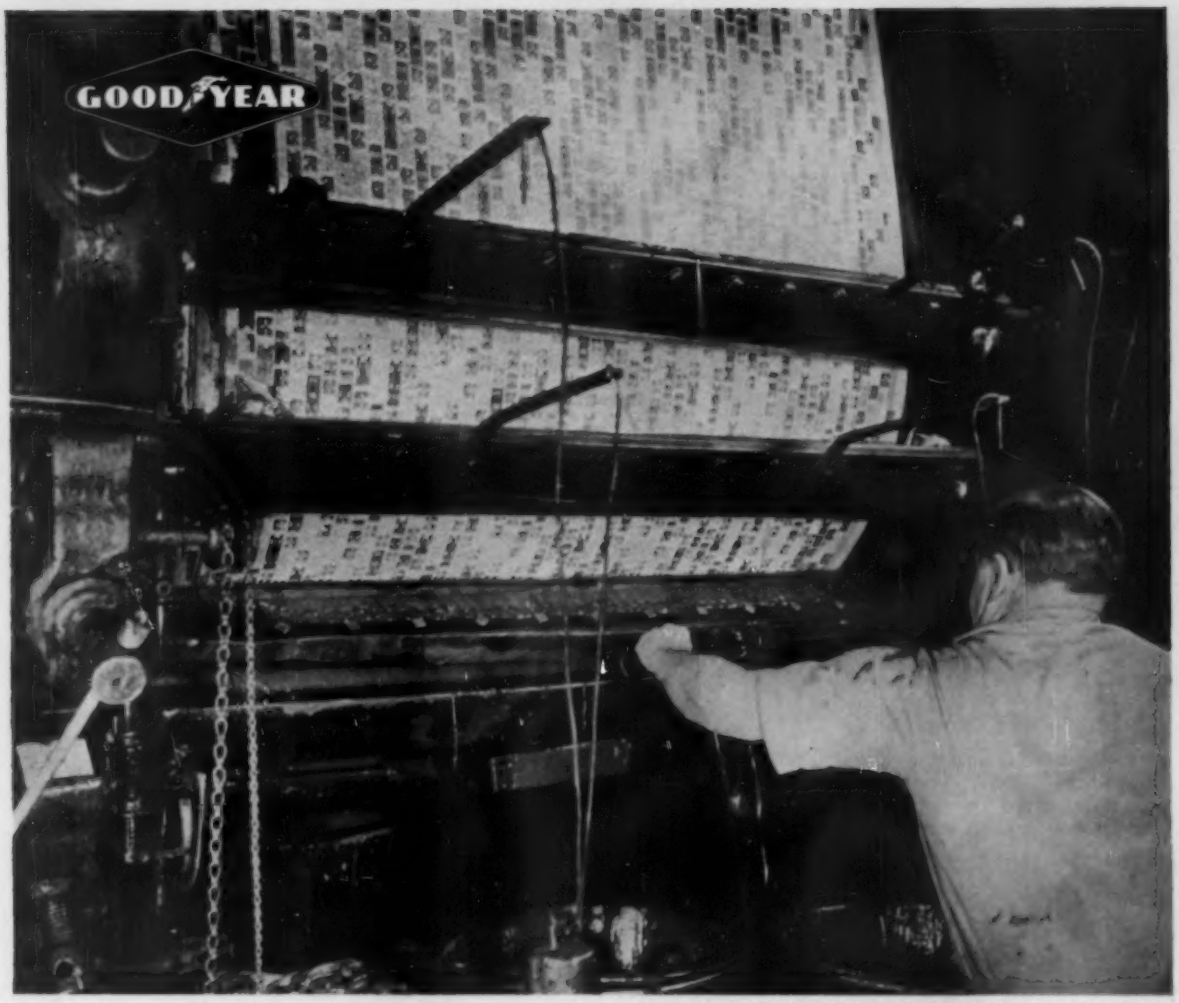


Photo courtesy of Union Textile Printers, Inc., Secaucus, N. J.

Prints are true blue *(or any color)* with CHEMIGUM LATEX

The big problem this manufacturer faced in making print colors and in the printing of textiles was "crocking." But he found a lasting solution in CHEMIGUM LATEX.

The "liquid lock" CHEMIGUM LATEX puts on pigments—even when applied to polyester fabric and acetate taffeta—keeps crocking to an all-time low. What's more, CHEMIGUM LATEX runs smoothly, doesn't break down, prevents ink build-up on the roller. And there's no problem to making any color in the rainbow "fast."

CHEMIGUM LATEX works wonders for textiles. Its adhesion, flexibility, light color and permanence, plus ease of compounding and processing make it ideal for binders, coatings, finishes and adhesives. For full details, including the latest *Tech Book Bulletins,* on CHEMIGUM LATEX, write Goodyear, Chemical Division, Dept. R-9433, Akron 16, Ohio.

Lots of good things come from

GOODYEAR

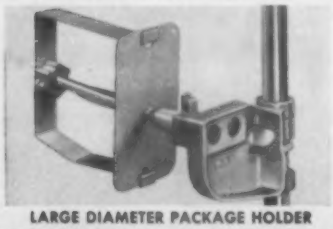
CHEMICAL DIVISION

Chemigum—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

HERE'S HOW TO HANDLE ANY PACKAGE WITH McBRIDE VERSATILE PACKAGE HOLDERS

McBride Bowed Spring Spindle with cone and large package holders can accommodate every type of package used on Over End Take-Off today. Adapters feature the quick change design for instant placement or removal, to **cut down changeover time loss.**

UNIVERSAL CONE HOLDER



LARGE DIAMETER PACKAGE HOLDER

MERCURY SWITCH STOP MOTION

Let McBride study your creel requirements. You will be pleased with the improved efficiency, ease of operation, and rugged design of McBride creels. Creels for warping, weaving, winding, twisting, tufting, and knitting. Special laboratory warping units designed to suit your requirements.

Complete engineering service is part of every McBride installation

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CALENDAR

June

National Association of Waste Dealers, Midwestern Div., Conrad Hilton Hotel, Chicago, Ill., June 9

1960 Gordon Research Conferences on Textiles: Colby Junior College, New London, N. H.; New Hampton School, New Hampton, N. H.; and Kimball Union Academy, Meriden, N. H.; June 13 to Sept. 2

ASME, Applied Mechanics Conference, Penn. State University, University Park, Pa., June 20 to 22

Southern Textile Association, annual convention, Grove Park Inn, Asheville, N. C., June 23 to 25

ASTM, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., June 26 to July 1

September

Combed Yarn Spinners Association, annual meeting, The Cloister, Sea Island, Ga., Sept. 8 & 9

Textile Quality Control Association, fall meeting, Clemson House, Clemson, S. C., Sept. 8 & 9

Production Engineering Show, Navy Pier, Chicago, Ill., Sept 6 to 16

First International Textile Dyestuffs, Finishes, and Auxiliaries Exhibition, Free Trade Hall, Manchester, England, Sept. 22 & 23

Chemical Finishing Conference, sponsored by the National Cotton Council, Statler Hotel, Washington, D. C., Sept. 27 & 28

October

21st Southern Textile Exposition, Textile Hall, Greenville, S. C., Oct. 3 to 7

Carded Yarn Association, annual meeting, Grove Park Inn, Asheville, N. C., Oct. 6 & 7

AATCC, national convention, Sheraton Hotel, Philadelphia, Pa., Oct. 6 to 8

Institute of Textile Technology, Charlottesville, Va., October 18 & 19

AATCC, Northern New England section, meeting, Hotel 120, Dedham, Mass., Oct. 21

Textile Operating Executives of Georgia, Hightower Textile Building, Georgia Tech, Atlanta, Ga., Oct. 22

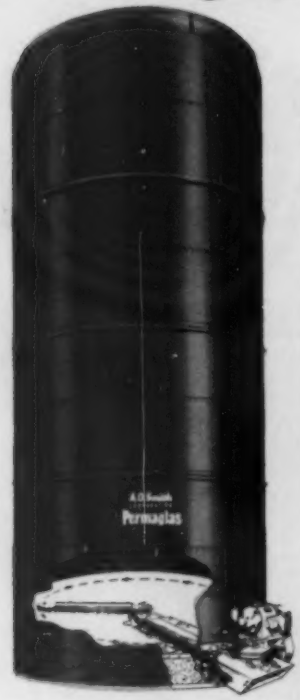
November

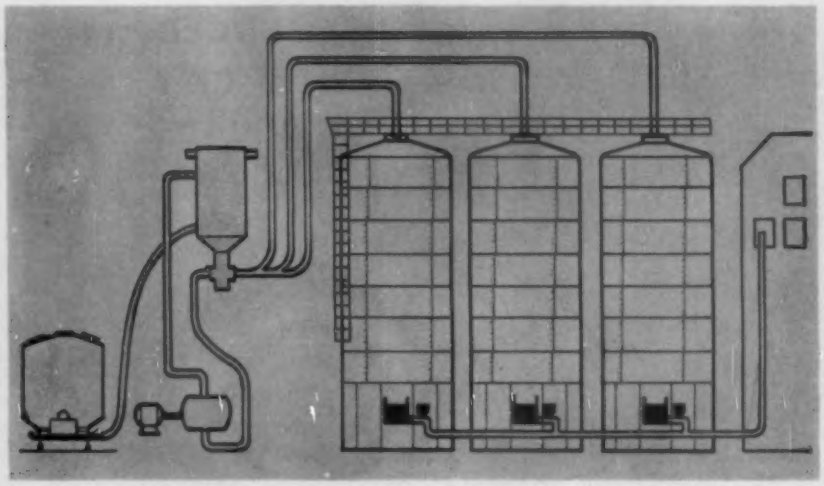
Thread Institute, annual meeting, Hotel Commodore, New York, N. Y., Nov. 10

Textile Education Foundation, Inc., A. French Textile School, Georgia Tech, Atlanta, Ga., Nov. 12

Power & Mechanical Engineering Exposition, New York Coliseum, New York, N. Y., Nov. 28 to Dec. 2

Here's a "TRIPLE-THREAT" to the high cost of handling bulk materials





Here's a typical vacuum-pressure system for Permaglas Storage Units. A. O. Smith distributors have the "specialized" know-how to plan and help solve your bulk materials conveying problems.

Permaglas® *Storage Structures ...mechanical "sweep-arm" bottom unloader ...pneumatic conveying system*

Permaglas Mechanized Storage Structures offer a "dynamic challenge" to the higher cost, conventional methods used in handling and storing of bulk materials. You can realize lower costs in your processing operations when *slow and expensive* methods are replaced with *Permaglas* Mechanized Storage Units. Equipped with the *exclusive* "sweep-arm" mechanical bottom unloader, they can be incorporated into an efficient pneumatic or mechanical conveying system. Here's how you benefit:

- A completely enclosed, "push button controlled" bulk materials handling system is now possible.
- Incoming "bulk" cars or trucks can be unloaded pneumatically or mechanically directly into the *Permaglas* Storage Structure.
- The mechanical "sweep-arm" bottom unloader discharges bulk materials directly into the conveying system to the process lines.
- This means substantial savings in labor, eliminates bags, bins, barrels, handling equipment and the maintenance of this equipment . . . eliminates material losses by breakage or spillage . . . helps prevent hazardous accidents.
- *Plus this exclusive feature. Permaglas* Storage Structures are glass-fused-to-steel construction both inside and out. Makes possible sanitary, easy to clean bulk materials handling systems. Eliminates corrosion, safeguards products from contamination and infestation. Reduces structure maintenance to a minimum.

This low cost way to handle and store bulk materials can be accomplished with minimum capital investment. Certainly it is worth further investigation. Mail coupon for details.

Through research ...*a better way*

A.O.Smith
CORPORATION
HARVESTORE PRODUCTS DIVISION
KANKAKEE, ILLINOIS
A. O. Smith International S.A., Milwaukee 1, Wis.

A. O. SMITH CORPORATION
Permaglas Storage Units, Dept. TW-60
Kankakee, Illinois
Send me free Permaglas Mechanized Storage Unit Bulletin MU-107.

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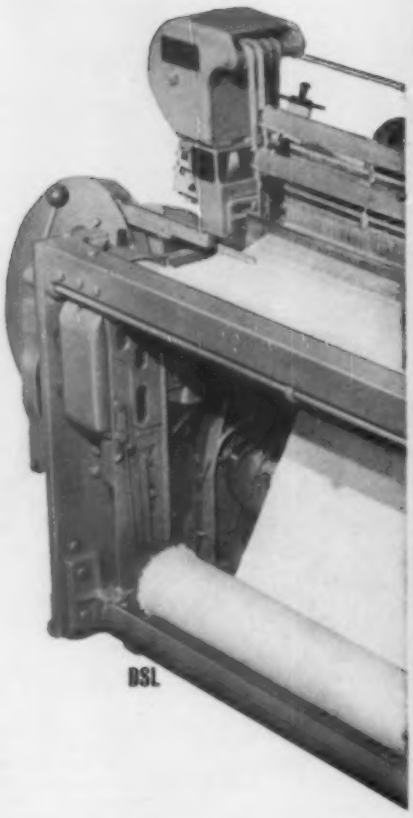
INTRODUCED
IN ATLANTIC CITY
THE THREE NEW ARRIVALS

in the family of DRAPER Looms


DSL

DSL

DRAPER SHUTTLELESS LOOM

a revolutionary break with convention

a new horizon in weaving

X-3

high speed versatility

new construction

improved performance

XB

rugged stability

mechanical excellence

planned economy

THREE BRAND NEW LOOMS

for complete details

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DRAPER CORPORATION

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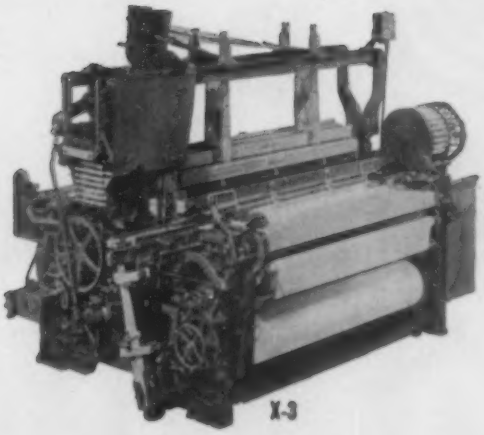
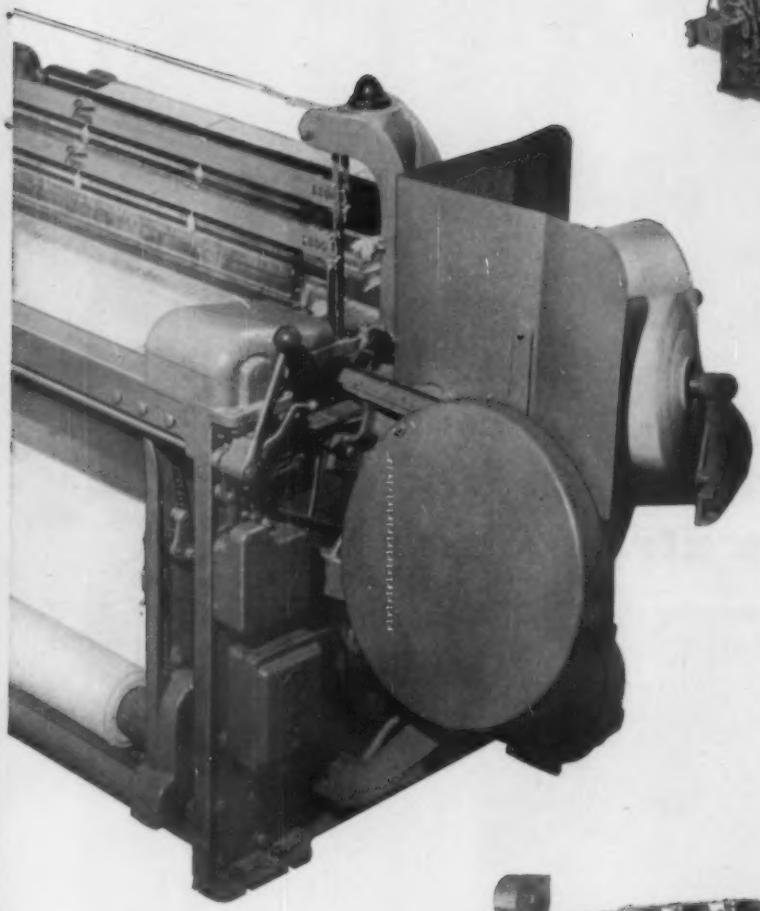
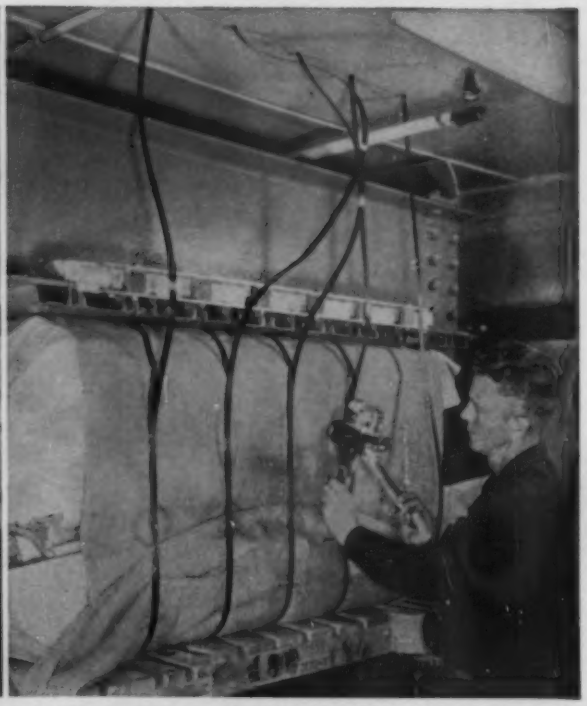


X-3



XB

Strapping is fed from dispensers in room above press. A magnetized bar holds the straps in position while bale is readied.



Signode's exclusive Model SFC tool tensions the strapping, feeds seals from magazine, and crimps them. Straps are severed at the seal. No waste strap.

Signode way produces denser bales and reduces strap use by 17%

Strapping dispensers can be in a variety of locations. Above, they are shown set up in an overhead storage area; at right they are shown installed on a framework over the press. They may also be installed on the floor beneath the press or behind the operator.

Here's an example of a simple and inexpensive answer to a packaging problem. Waste—which was part of the former cut-to-length strapping method—was eliminated, with a 17% saving in the amount of strapping used. Bales are better looking. Their increased density saves about 7% of valuable space in storage and shipment. The entire strapping operation is simplified, goes easier and faster.

Why not let a Signode man take a new look at your packaging and shipping operation. He has an eye for savings, specialized knowledge of textile applications, and a complete line of strapping tools and machines at his disposal. Call him today, or write:

Exclusive Straptrollers prevent overrun of strapping from dispensers

SIGNODE

First in steel strapping

SIGNODE STEEL STRAPPING CO.

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"Join me on a plant tour . . . see why

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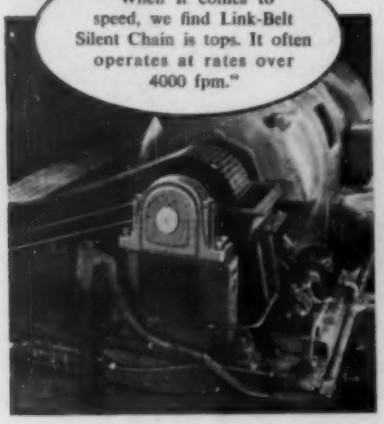

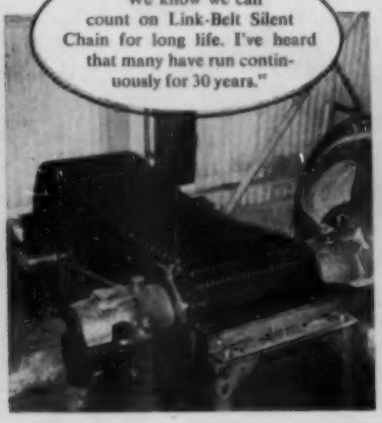

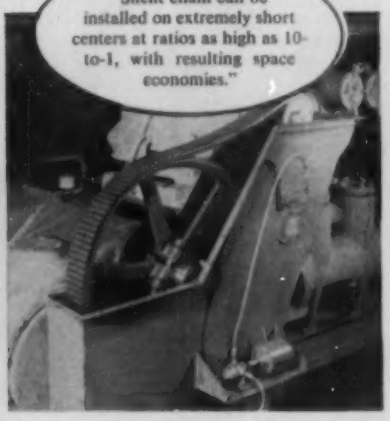

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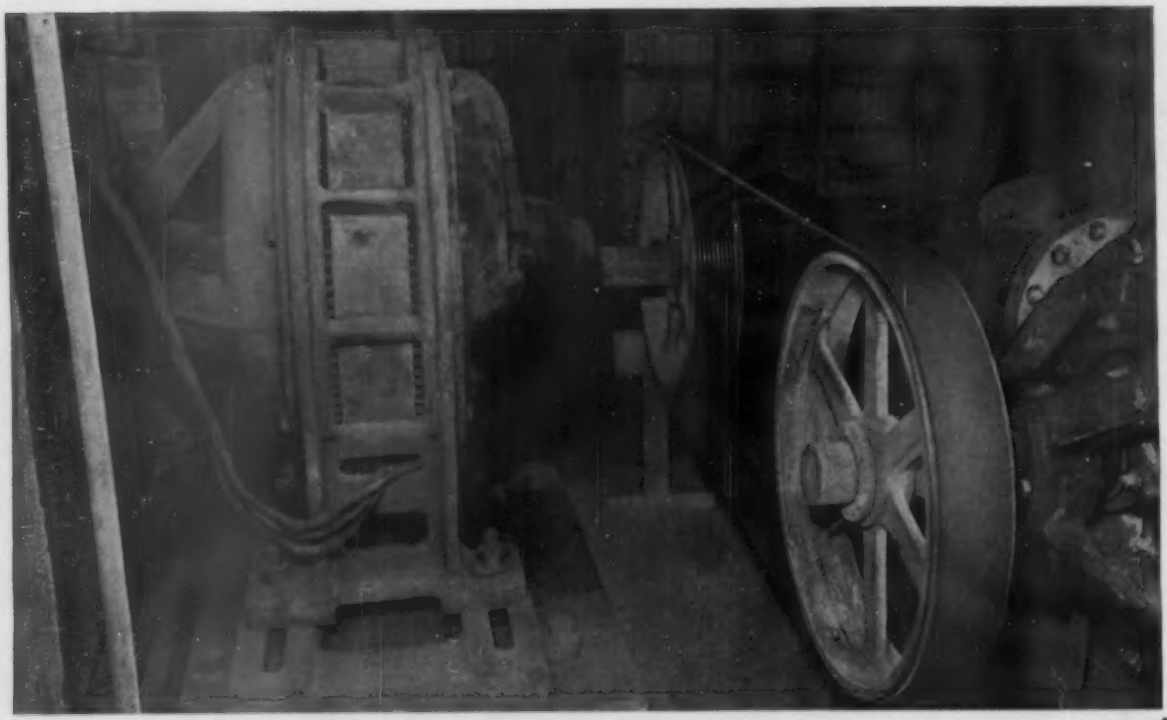
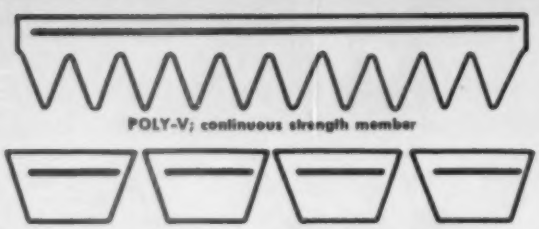
FULL DETAILS on Link-Belt Silent Chain are offered in 88-page Book 2425. Get your copy from your Link-Belt office or authorized stock-carrying distributor. Look under CHAINS in the yellow pages of your phone book.

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 10042





"MORE USE PER DOLLAR"

Poly-V Belt is a single unit with even, uniform pull. Uninterrupted strength member gives much higher hp capacity per inch of drive width. No belt drive delivers as much power in the same space as Poly-V!

THIS R/M POLY-V® DRIVE OUTLASTED V-BELTS 8-1!

V-belts were replaced every six months on this gas pump drive in a southern chemical plant—until the company converted to R/M's patented Poly-V Drive. The single Poly-V Belt pictured above has been in operation for over 4 years on a barium process operation. Four years for the R/M Poly-V Drive versus 6 months for an ordinary V-belt drive! The savings and advantages to production are obvious.

R/M Poly-V Drive solves difficult drive problems wherever heavy duty power transmission is required. Single unit design permits *narrower* Poly-V sheaves to deliver *equal* power in a much smaller space or much *more* power in the same space as a V-belt drive! The drive runs smoother because there's no sinking of belt in sheave grooves. Belt speed ratios remain constant from *no* load to *full* load for uniform power delivery—with less wear on belts and sheaves. V-belt "length matching" problems are completely eliminated . . . and just two belt cross sections meet every heavy duty requirement. Let an R/M representative show you other advantages of converting to R/M Poly-V Drive. Write for Bulletin M141.

- **More Power—Less Space**
- **Eliminates "Matching" Problems**
- **Maintains Groove Shape**
- **Assures Constant Speed Ratios**
- **Longer Belt and Sheave Life**
- **Cooler, Smoother Running**

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When You Change Drives, Convert to Poly-V and Be Sure!

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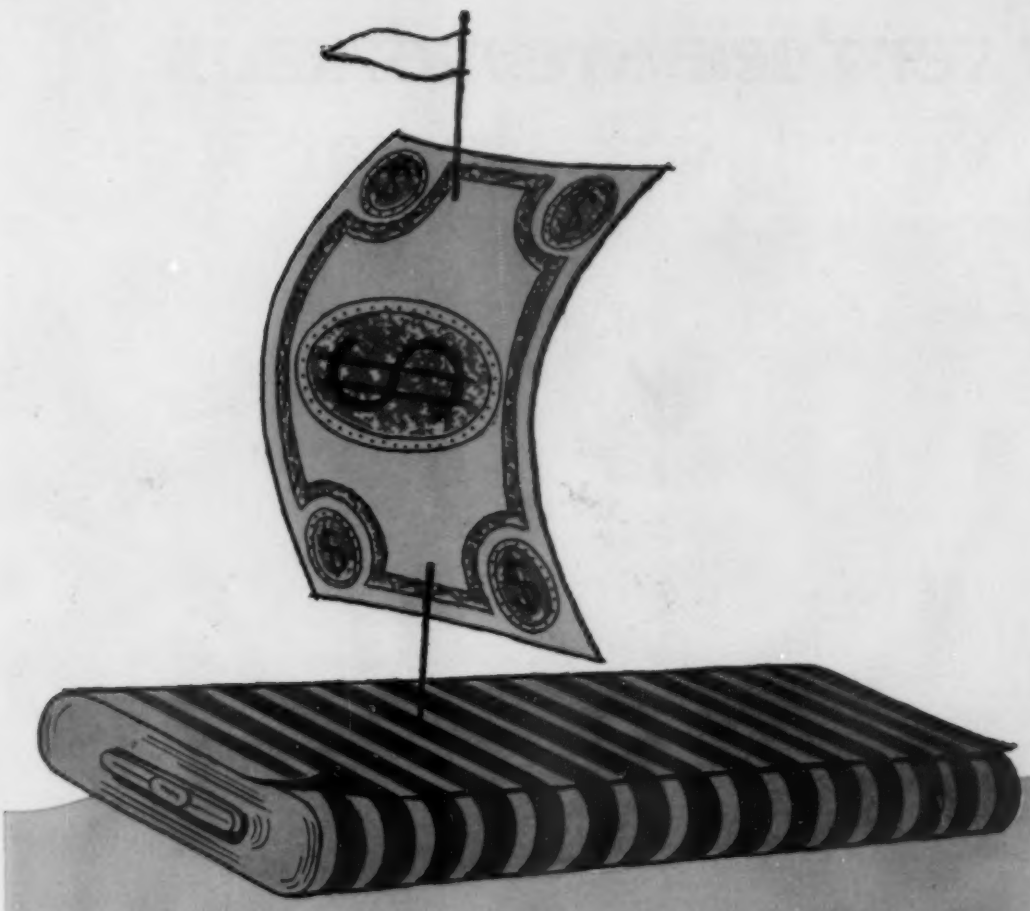
ENGINEERED RUBBER PRODUCTS ... MORE USE PER DOLLAR



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(Neutral 35% Active Alkyl Aryl Sulfonate)

There's one simple reason why NACCONOL SL is the largest selling liquid detergent in the textile industry. It's the best detergent buy!

NACCONOL SL delivers more cleaning power per dollar on an active ingredient basis than most dry products. As a liquid, it also cuts production time and costs and minimizes waste. Clean and easy-to-handle, NACCONOL SL requires no dissolving, remains clear and free-flowing even below 32°F.

A mill trial will quickly convince you of the economy of NACCONOL SL. Call or write your nearest National Aniline office for a test sample.

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Humiduct is an exclusive Bahnson design. A space saving, unit type system, it offers highest air conditioning efficiency at lowest cost.

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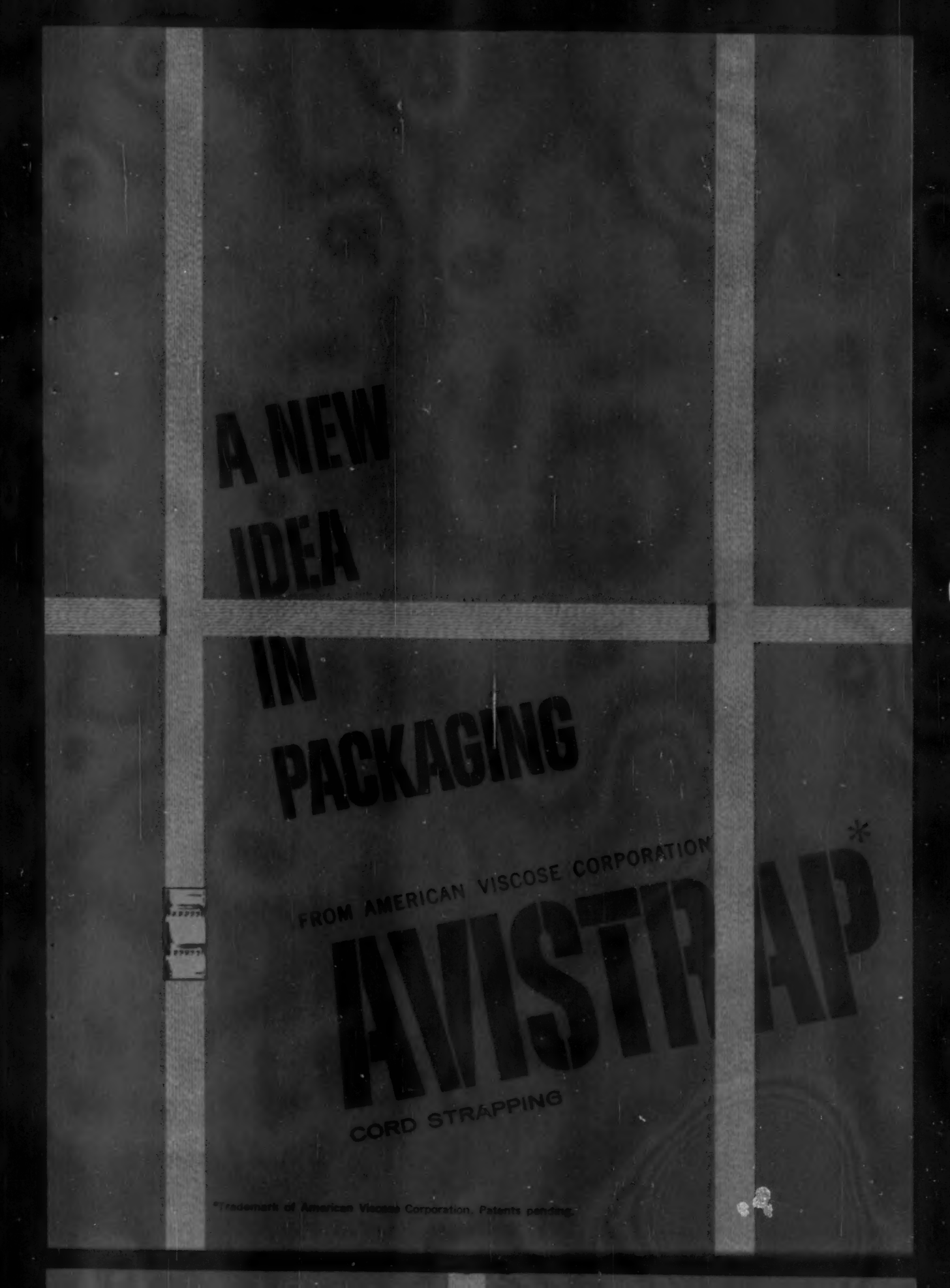
A NEW
IDEA
IN
PACKAGING
FROM AMERICAN VISCOSE CORPORATION
AVISTRAP*
CORD STRAPPING
*Trademark of American Viscose Corporation. Patents pending.

SUPER STRENGTH

AVISTRAP cord strapping is a radically new strapping material manufactured from super strength Avisco® rayon. AVISTRAP has ample strength for many applications which now require steel strapping . . . is many times stronger than reinforced tapes . . . actually outperforms steel in extensibility and impact resistance.

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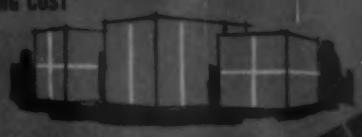
SHIPPING COST



COST PER PACKAGE

ECONOMY

AVISTRAP cord strapping lets you [illegible] per dollar than [illegible] greatly reduces shipping [illegible] it weighs [illegible] 1/7 to ¼ as much as steel strapping of comparable width. AVISTRAP costs far less than reinforced tape of comparable strength. You may lessen initial cost, invest far less per package.

REDUCES DAMAGE

AVISTRAP cord strapping is highly flexible [illegible] around corners without cutting cartons. Properly tensioned, AVISTRAP cannot [illegible]. And AVISTRAP will not rust.

*Trademark of American Viscose Corporation. Patents pending.

FAST, EASY HANDLING

AVISTRAP cord strapping coils weigh approximately 21 lbs., complete with disposable spool (yardage equal to 100 lb. coil of steel strap). Coils can be changed in seconds. Just throw away the empty spool, put the new AVISTRAP coil in place. No unwrapping, no complicated changing of reels.

SAFETY

AVISTRAP cord strapping has no sharp edges, cannot cut hands or otherwise injure personnel. When over-tensioned, AVISTRAP does not lash out with jagged ends. And there is no disposal hazard with AVISTRAP. It is easy to handle, and can be burned.

advantages entirely new in industrial packaging ...tested and proved by industry

Extensive testing in actual industrial [illegible] AVISTRAP cord strapping deli[illegible] safety, and many more ma[illegible] pers. Just a few, in [illegible]

Because AVISTR[illegible] and cannot [illegible] ized steel [illegible]

AVIS[illegible] by consignee, by [illegible] ding methods.

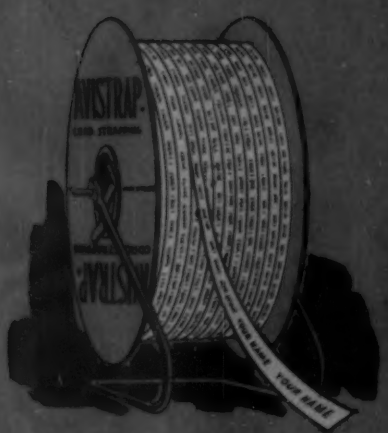
L[illegible] disposable spool means less do[illegible] ing lines with AVISTRAP.

AVI[illegible] requires little storage space. A 1,000-yd. spoo[illegible] AVISTRAP measures 13½" in diameter, is onl[illegible]" wide, and weighs only 21 lbs.

AVISTRAP is shipped on pallets made up of easy-to-handle packages . . . single-coil or four-coil cartons.

AVISTRAP is a stronger replacement for many reinforced filament tapes, at lower cost.

For more information on AVISTRAP, tools, seals, and accessories see next page. ▶



LOW COST IMPRINTING

It costs less to imprint AVISTRAP cord strapping with your trademark or company name than to imprint steel strap. Compared with printed reinforced filament tapes, AVISTRAP shows even greater economy. Some advantages of imprinting: promotional value, quick identification of otherwise plain-looking packages, reduced pilferage.

test AVISTRAP cord strapping in your plant

All AVISTRAP cord strapping distributors are equipped to give in-plant demonstrations of AVISTRAP strapping. If you would like to make a comparison of AVISTRAP and the materials and methods you are now using, contact AVISTRAP Department, AMERICAN VISCOSE CORPORATION, for the name of the distributor nearest you.

To request more information or a sample of AVISTRAP cord strapping, use this coupon.

Name_____

Title_____

Company_____

Addr[illegible]

Ci[illegible] [illegible]

[illegible] request)

☐ Pl[illegible] AVISTRAP cord strapping sample.

☐ Pleas[illegible] application information, prices for AVISTRAP cord strap[illegible] and name of local distributor.

☐ Please contact me to make arrangements for a demonstration of AVISTRAP cord strapping in my plant.

Fast and Dependable Local Service Completes the Picture

Users of AVISTRAP cord strapping will be served by well-stocked local distributors. Immediate delivery, fast tool service and prompt access to men experienced in handling and application of AVISTRAP strapping are already available in major industrial areas. Get the name of the AVISTRAP cord strapping distributor nearest you from AVISTRAP Department, American Viscose Corporation, 1617 Pennsylvania Boulevard, Philadelphia 3, Pa.

AVISTRAP*

CORD STRAPPING TOOLS

SEALS • ACCESSORIES

AVISTRAP
CORD STRAPPING SIZES

Type	Nominal width
20	¼"
30	⅜"
40	½"
50	⅝"
60	¾"

In addition to AVISTRAP cord strapping in all sizes, distributor stocks include the full range of AVISTRAP tools . . . a wide selection of accessories, tensioners and sealers for various strapping methods and procedures. Distributors also furnish facilities for fast tool repair.

AVISTRAP*

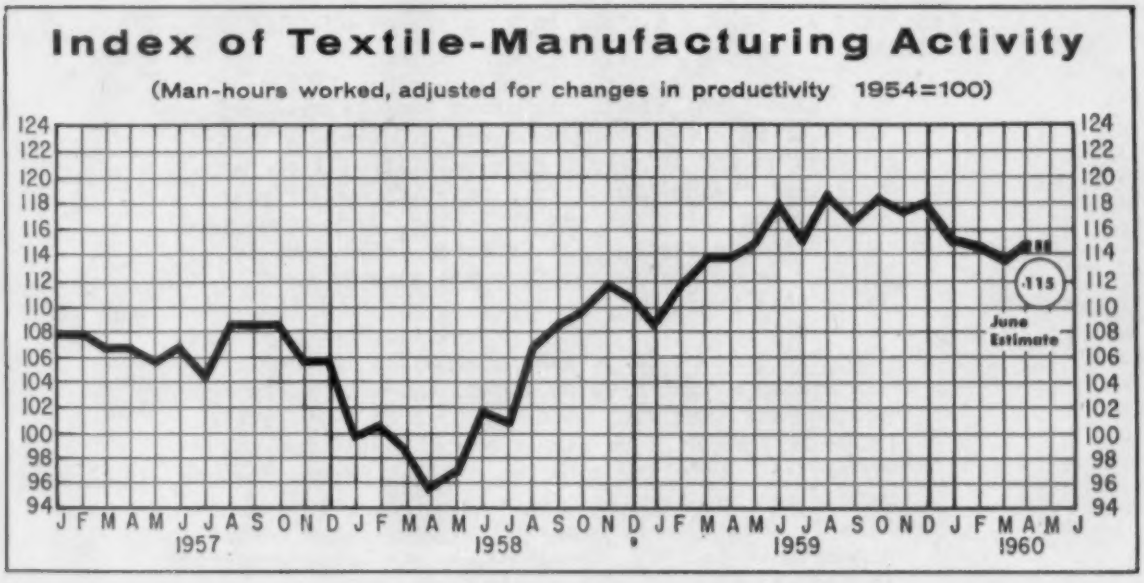
CORD STRAPPING

To request more information or a sample of AVISTRAP cord strapping, fill in reverse side of this coupon and mail to:

AVISTRAP Cord Strapping
AMERICAN VISCOSE CORPORATION
1617 Pennsylvania Boulevard
Philadelphia 3, Pa.

*Trademark of American Viscose Corporation. Patents pending.

AVISTRAP cord strapping is a new product of AMERICAN VISCOSE CORPORATION, makers of rayon, acetate, cellophane, plastics.



Promise for '60

Textile men see the promise of a record year on its way.

What are the signs? More employment. Higher personal income. More available goods. Greater consumer sales.

Employment has risen from 64.3-million persons in March to 66.2 million in April. Unemployment has declined in the same period from 4.2 million to 3.7 million. (Although unemployment is still about 5% of the labor force, it is declining as production increases get under way in coming months.)

Personal income will sustain a high level right through 1960. (For the year as a whole, personal income is expected to be 5% above last year.)

Newly produced goods and services were turned out by the economy at a record-breaking level in the first five months of 1960. Gross national product, expressed as an annual rate, reached a level of $503-billion in the first five months of 1960. That was right on the course for GNP to achieve an over-all total during the year of $510-billion.

Consumers are spending their increased incomes on more products. And they are spending a larger share of their incomes on apparel than they have in the past. So far, retail sales of apparel have grown at more than twice the rate for all types of retail sales. The dollar volume of apparel sales is about 9% higher this year than for the same period last year.

Figures of the Month

TEXTILE INDUSTRY INDICATORS

	Latest Month	Previous Month	Year Ago
Textile World's Exclusive Index (chart above)	115	114	115
Employment (thousands)[1]	957.6	957.0	958.7
Production Workers (thousands)[1]	864.0	863.4	867.6
Weekly Earnings[1]	63.60	63.83	63.43
Hourly Earnings[1]	1.61	1.62	1.57
Weekly Hours Work[1]	39.5	39.4	40.4
Production Index[2]	127	127	117
Wholesale Price Index[3]	96.2	96.3	94.1
Manufacturers' Sales (million $)[4]	1210*	1260	1200
Manufacturers Inventories (million $)[4]	2640*	2650	2451
Inventories-to-Sales Ratio	2.18*	2.10	2.04
Exports (Million $)[5]	164.4*	165.4	93.0
Imports (million $)[5]	118.0*	111.1	104.4
Stock Price Index (1941-43=10)[4]	27.63	27.99	28.01
Failures[6]	4	12	4

NATIONAL INDICATORS

Industrial Production (1947-49=100)[2]	165	165	150
Consumer Price (1947-49=100)[3]	125.8	125.7	123.9
Wholesale Price (1947-49=100)[3]	120.0	120.0	120.0
Civilian Population (millions)[4]	177.4	177.1	173.9
Unemployment (millions)[4]	3.7	4.2	3.6
Employment (millions)[4]	66.2	64.3	65.0
Personal Income (billion $)[5]	397.4	394.0	372.7

*March. Otherwise, latest month is April.

1. Bureau of Labor Statistics; 2. Federal Reserve Board; 3. Department of Commerce; 4. Standard & Poors; 5. Dun & Bradstreet; 6. Bureau of the Census.

NEWS and COMMENT . . . . . .

WHICH WAY WILL TEXTILES TURN? UP OR DOWN? Financial analysts are taking a stand on both sides--and in the middle.

The Value Line Investment Survey sees growing evidence of an approaching downturn. Conceding that production and shipments have held up well so far this year, Value Line points out that new orders are lagging, backlogs are shrinking, grey-goods inventories are rising. It foresees price cuts to bolster demand--and therefore pressure on profits later this year.

Standard & Poors Corp. sees production in the first six months slightly below a year ago--but a stronger second half that will bring 1960 up to 1959 levels. Sales in 1960 will be higher than in 1959 for most companies. Pointing out that mill shipments now are mainly against backlogs booked at 1959 prices, S. & P. sees 1960 earnings of major mills a little higher than in 1959, though there may be some easing in the second half of the year.

The Wall Street Journal notes a strong pickup in orders for printed cotton textiles and for fine combed-yarn fabrics. The quickening pace in combed-yarn fabrics is firming prices that had weakened earlier when backlogs dwindled, the newspaper said.

MEANWHILE, EARNINGS OF AMERICAN TEXTILE PRODUCERS REVEALED A STRONG TONE.

FIRST-QUARTER SAMPLINGS:

Dan River Mills: Sales at $43.6-million, up from $42.6-million a year earlier. Net earnings at $1.88-million, a gain of 50% over a year ago. W. J. Erwin, president, said he felt encouraged about the outlook for the remainder of the year.

Cone Mills Corp.: Sales at $47.5-million, up from $45.6-million a year ago. Net income at $1,119,627, up from $965,045 a year earlier. President Caesar Cone told stockholders that the company now has 25% more unfilled orders than a year ago.

The Kendall Co.: Sales of $25.6-million, slightly down from $25.9-million a year earlier. Net earnings at $2,254,000, well up from $1,842,000 a year ago.

Kayser-Roth Corp.: Sales at $32-million, up from $26.9-million a year ago. Net at $1.4-million, up from $1.1-million a year ago.

SIX-MONTH SAMPLINGS:

Burlington Industries, Inc.: Sales at $464.6-million, up from $378-million a year ago. Net at $21.2-million, up from $10.1-million a year earlier.

Textiles, Inc.: Sales at $15.4-million, up from $13.8-million a year earlier. Earnings at $866,211, up from $560,306 a year ago.

Riegel Textile Corp.: Sales at $50.6-million, up from $48.9-million a year earlier. Net at $1,281,058, up from $622,766 a year ago.

NEWS OF THE MONTH FROM OVERSEAS RANGES FAR AND WIDE.

Sweden: The textile industry, which suffered from heavy imports until recently, now shares a general improvement in business, says Raymond Shah, TEXTILE WORLD's correspondent in Zurich. Mill management complains of a shortage of skilled workers.

Netherlands: Verolme United Shipyards, Rotterdam, soon will be producing synthetic and organic textiles with a thin metallic coating (mainly aluminum) applied under high vacuum by means of evaporation, reports Paul Catz, TW's news bureauman in Amsterdam. Coating is so thin that original material shows no change. Applications: decoration, packing, fashions, insulation.

Tanganyika: Japan has captured the East African textile market from India, says TW's correspondent Michael Fernandez. Indian industry leaders admit they have failed to cater to the needs of African buyers.

Red China: Sol Sanders, TW's news bureauman in Tokyo, reports that Red China plans to produce 8% more cotton yarn in 1960 than in 1959. About 105 mills (cotton, wool, flax, ramie, silk) are being built or enlarged. In Shanghai, for example, the textile industry now is 88% mechanized (only 62% earlier this year). Production in 1959 reached targets set for 1962. Details: Cotton yarn, 8.25-million bales (up 35% from 1958); cotton cloth, 7,500-million yards (up 32%); wool fabrics, up 19%; silk fabrics, up 32%.

U.S.S.R: Some 66% of the steep increase in textile capacity under the Seven-Year Plan (1959-65) will rest on 105 large mills scheduled to start operations within that period, reports F. H. Baer, TW's correspondent in Vienna. The remaining 34% will come from enlargement and modernization of existing mills.

WASHINGTON OUTLOOK .....

U.S. trade policy--in part and as a whole--is under attack. The offensive against the spirit of freer trade (the spirit that has marked Washington ever since 1934) is not confined just to the U.S. textile industry, although domestic mills are in the fore of the assault.

An example of the breadth of protection sentiment is the resolution sponsored by Sen. Robert Kerr (D-Okla.) expressing the "sense of Congress" that no new tariff reductions should be offered by the U.S. at the forthcoming international meetings of the 37 nations who belong to the General Agreement on Tariffs and Trade (GATT) at Geneva, Switzerland this coming fall.

The Kerr resolution may never reach a final vote in this session of Congress. But it is bound to have a limiting effect on the government's negotiating team, by the mere fact that it has been introduced.

One almost certain restraint the Kerr resolution will effect is this: Washington will probably refuse to lower its present restrictions on cotton textiles, and possibly also on woolen goods. These items are on the list on which U.S. trade policy officials were prepared to negotiate lower trade restrictions. But a strong industry reaction has all but spiked that move, despite strong pressures from U.S. allies (particularly Great Britain, Japan, Italy, India, and Hong Kong).

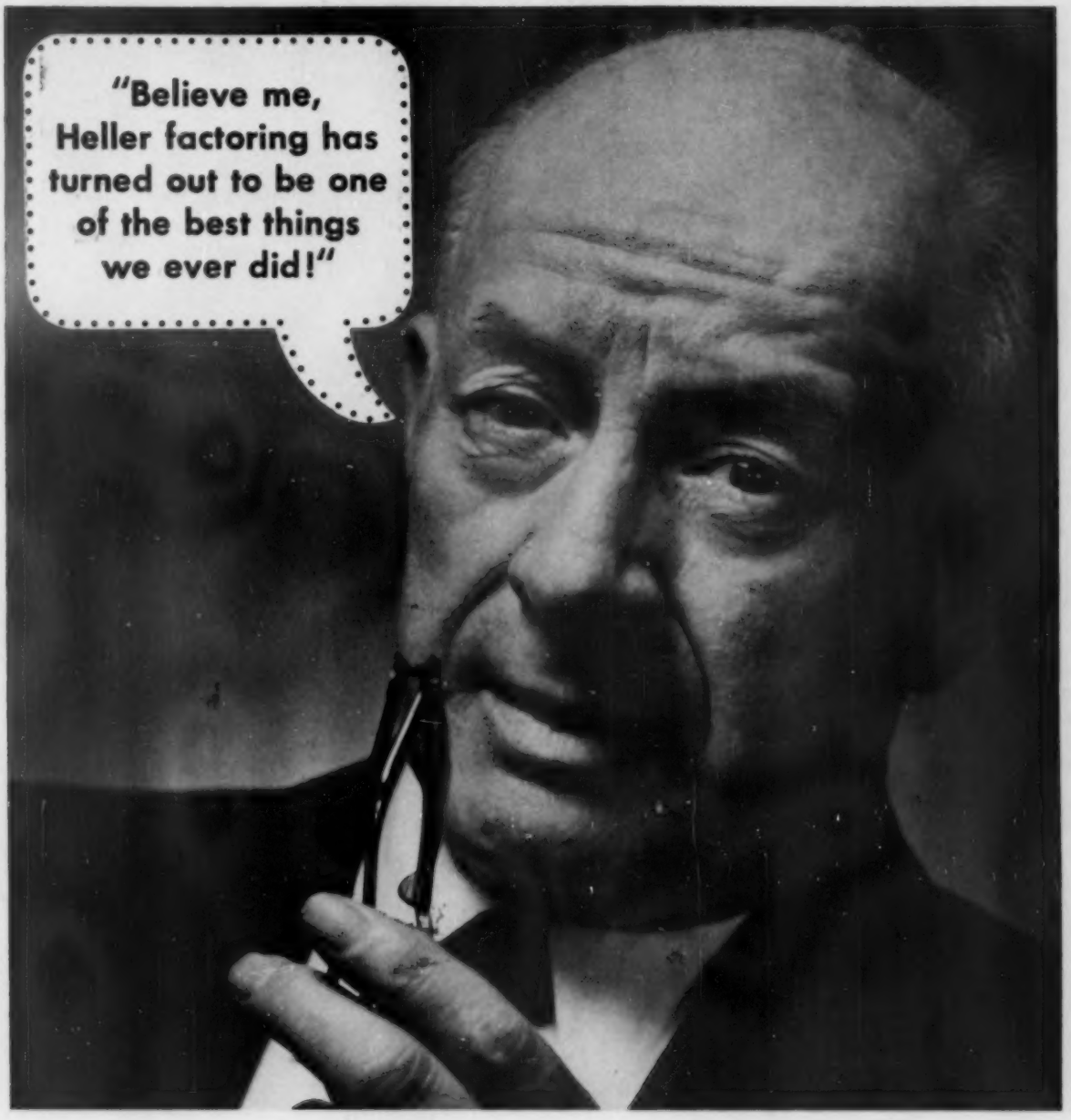
But aside from such specific concessions to domestic industrial considerations, the White House has decided to stick with its relatively "liberal" trade line. The reason hits the bed-rock of Administration foreign-trade policy: The U.S. must buy more abroad in order to sell more abroad. And the White House has settled on a drive to expand U.S. exports as the best practical solution to its mounting international deficit in its balance of payments (which mounted to $3.7-billion in 1959.) For that reason, the President is expected to throw all his remaining political weight behind a Washington drive to boost exports, and bargain the best possible tariff reductions from Europe's two trade blocs in the process.

European negotiators have already hinted that they will offer more trade concessions to benefit U.S. exports than they will demand in the way of lower U.S. import duties.

In line with its new export promotion drive, the Administration unveiled a program to guarantee exporters' short-term credit against the political risks of war, revolution, currency exchange, and import regulation in foreign markets. From now on, the Export-Import Bank of Washington will stand behind this type of credit, ranging from 30 to 180 days, through private commercial banks, which will act as Ex-Im's agents.

Tax cuts--while out this year--may be a hot issue in the election campaign this fall. Candidates Nixon and Kennedy have opposing views on the question now. Nixon holds hope that a tax cut can be made, Kennedy thinks a general tax cut would upset Democratic spending plans.

Tax benefits to U.S. investors overseas were approved by the house last month, by the hairbreadth margin of 195-192. They are embodied in a bill sponsored by Rep. Hale Boggs (D-La.). Close vote lengthens odds that Senate will pass the bill this session.



. . . Our principals now devote full time creatively to advancing the business, selling more, making more profits.

. . . No long wait for our money between buying materials, manufacturing, shipping, and eventual collection. Instead, cash-in-hand on every sale, cash for timely buying, for leveling production, for improving our competitive position.

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You ought to know about Heller factoring. Just write for informative booklet, "Profit Through Factoring." No obligation, of course. Dept. TW-6

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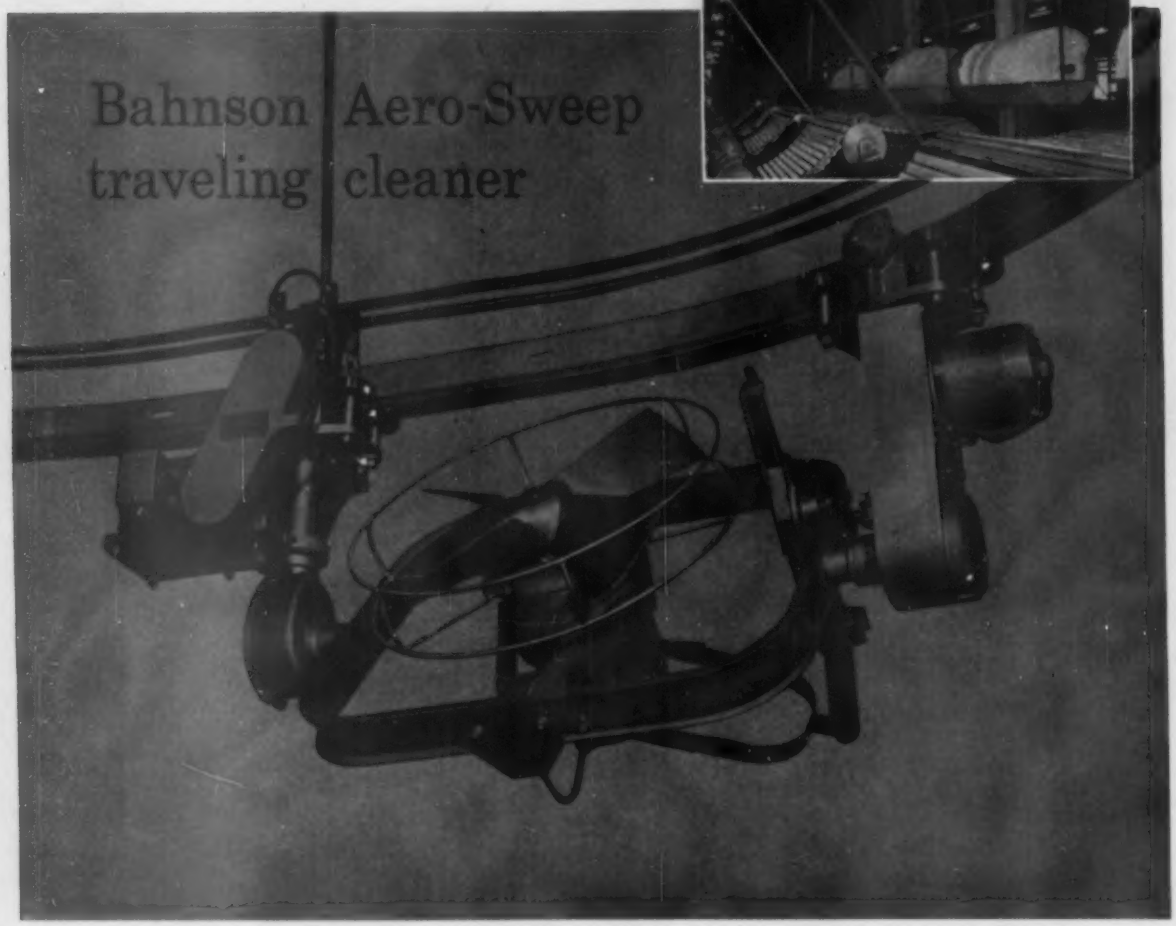
To the mill man who wants maximum overhead cleaning



You get maximum overhead cleaning with the Aero-Sweep Cleaner because:

- it cleans the objective more thoroughly with head-on air blasts at ½ the distance of other cleaners.
- it cleans all objects throughout cleaning cycle at predetermined frequency.
- only Aero-Sweep has an exclusive patented indexing feature which sets the cleaning pattern for any area, prevents lint accumulation on all surfaces.

You clean your mill at less cost with Aero-Sweep because:

- one Aero-Sweep Cleaner cleans up to three times the area covered by other cleaners.
- it ends manual blow-down by removing lint from ceilings, walls, overhead equipment.
- it minimizes slubs and gouts, improves quality of product.

For details, see free illustrated Bulletin 21A. Clip coupon to letterhead and mail today.

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AIR-O-MATION

THE BAHNSON COMPANY • WINSTON-SALEM, N. C.

Big? Yes. But Not Big Enough

WE'RE TALKING about capital expenditures in the textile industry . . .

. . . About outlay, current and planned, for building new mills and finishing plants, for buying new machines and equipment, for enlarging capacity, for modernizing present facilities.

. . . About the facts revealed in the 13th annual McGraw-Hill survey of business's plans for new plants and equipment.

That survey brings us to make four observations:

1. This textile industry of ours is going places. It's spending a lot of money on itself right now. And it has firm plans to spend still more money—big money—in the years ahead.

For this year alone, 1960, textile-industry management has earmarked $480-million for capital expenditures. That's more than is earmarked in nonferrous metals ($369-million), transportation equipment ($468-million), or rubber ($266-million.)

And that's not all. Look ahead. Right now the textile industry has preliminary plans to spend $1.3-billion over the three-year period 1961-63. That's about 30% more than is now planned for nonferrous metals and transportation equipment and well over twice as much as is now planned for rubber.

As for expansion, by 1963 the textile industry plans to have 10% more capacity than today. This rate of growth will outstrip that now set for iron and steel (7%), machinery (9%), transportation equipment (6%), paper and pulp (8%), and the petroleum-refining industry (3%).

2. There's no real worry about where the textile industry will get the money. The biggest chunk of it—some $359-million—is available right now in depreciation allowances set aside in 1959. In 1963 the industry will have even more—about $417-million—from the same source. That's enough to take most of the plow-back load off current profits.

3. Big as planned investment is, it's still not big enough. Not when you look ahead at bulging population. And not when you look at burgeoning consumer markets.

What we're saying is just this: If the textile industry expects to stay in the running at all, it must run faster than it now plans to. To pull out ahead—to cash in fully on all the opportunities of tomorrow—will demand even more.

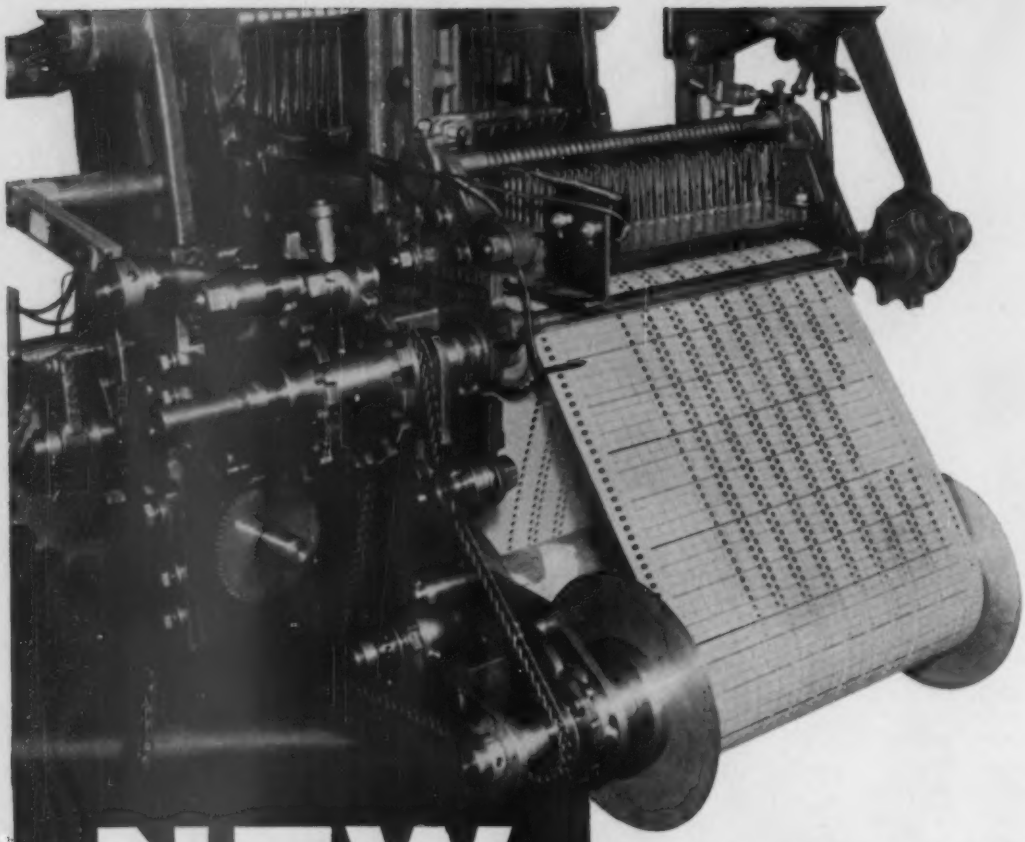
Right now, the McGraw-Hill survey shows, the textile industry expects sales to be only 11% higher in 1963 than in 1960. But other industries see their opportunities bigger: food and beverages, 16%; autos and trucks, 23%; chemicals, 21%; paper and pulp, 17%. If these other industries are right, textile management isn't thinking big enough.

4. Everywhere you look, challenges stick out that make bigger, wiser capital investment a "must" in this textile industry. You see these challenges in high labor costs, in demands for higher quality, in outdated buildings and machines, in new threats to markets you could once rely on.

How do you meet these challenges?

There's more to it than just writing checks for new buildings, new machines. Capital investment requires planning—the way management of Federal Spinning Corp. planned for that spanking new mill you'll read about beginning on page 30 of this issue—the way many a management man will soon be planning who walked bug-eyed through the American Textile Machinery Exhibition-International at Atlantic City some two weeks ago.

And what kind of planning is that? It's planning with eyes and ears wide open. It's planning that comes to grips with facts, looks to the long pull as well as the short haul, and makes a way for swift, bold action once decision is reached. With this approach you won't be spending your capital. You'll be investing it.



NEW

Reversing Roll Dobby Pattern Indication For Long Patterns

- *Utilizes pattern on strip instead of continuous belt.*
- *Eliminates bulky storage problems.*
- *Eliminates damage in handling and storage.*
- *Saves valuable floor space at loom.*
- *Available for present C & K Dobby Looms.*

The new type of Dobby pattern indication puts both the harness and box pattern on one continuous reversing strip. It is available on new C & K Dobby Looms as well as for existing Dobby Looms.

Harness and box patterns are punched so that a complete weaving cycle is achieved after the pattern has run forward the entire length and then back to the starting point. Operation is completely automatic and can be repeated indefinitely.

The new Reversing Roll Dobby Indicator reduces the problems of damage to patterns in handling and storage due to bulk. Pattern length compared with chain is cut 76%. 100 picks are contained in 1 foot of pattern length. Both paper or Mylar plastic pattern materials are available.

Call or write us for more information.

MANUFACTURERS OF THE WORLD'S LONGEST LINE OF AUTOMATIC BOX LOOMS

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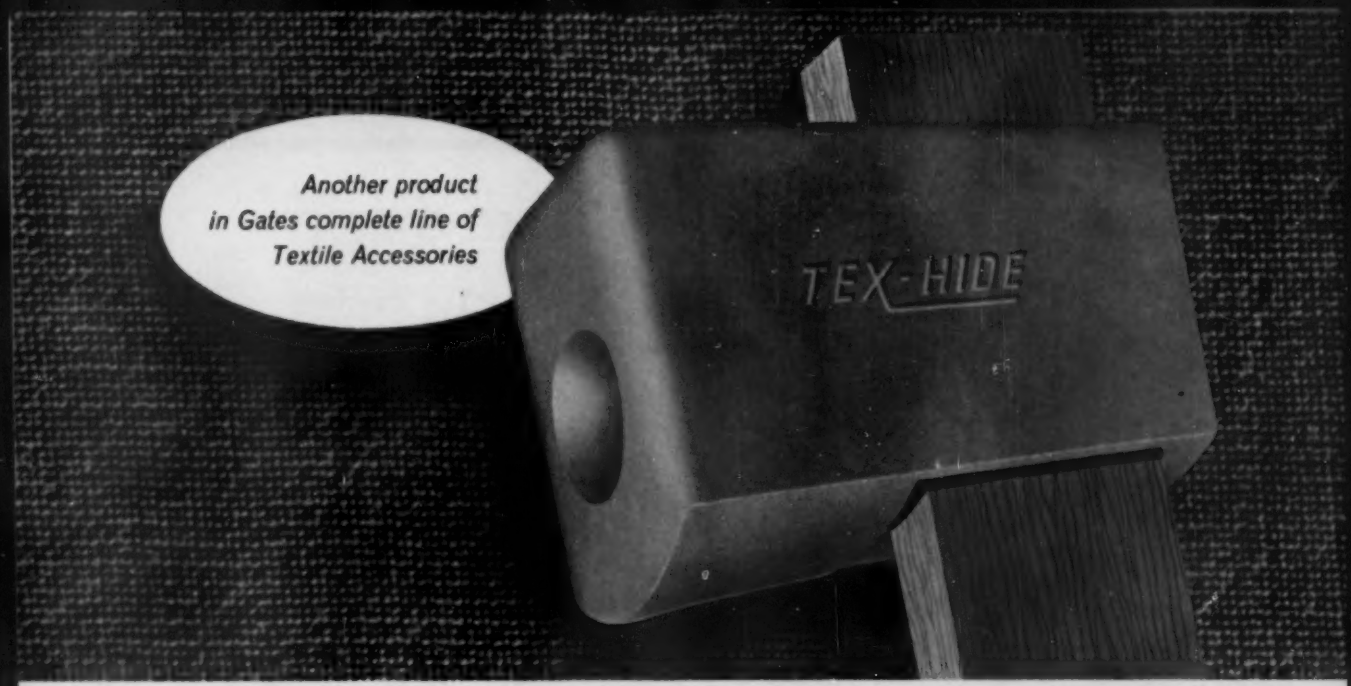
Charlotte, N. C. • Allentown, Pa. • Crompton & Knowles, Jacquard Supply Co., Pawtucket, R. I. • Crompton & Knowles of Canada Limited, Montreal, Que.



Another product in Gates complete line of Textile Accessories

Leading Mills* choose this Gates Loop Picker

Super Vulco Picker

Newest addition to Gates line of pickers. Pale pink color. Excellent for intermediate applications requiring both economy and durability.

There's a Gates Picker for Every Loom...

Vulco Picker

Molded of rubberized fabric... low cost. Designed for use in weaving cottons and specialty-type fabrics where low initial picker cost outweighs all other factors.

First in the Gates line of 3 outstanding loop pickers is Tex-Hide... a product of Gates Specialized Research.

Tex-Hide is a super-tough, highly resilient material that assures you of exceptionally long service life for Loop Pickers.

Because Tex-Hide provides all the shock absorbing capacity and resilience of natural leather, smoother loom operation over a longer period is assured.

Highest quality in cloth is maintained, and down time costs greatly reduced, for these 2 reasons:

1. **Maximum Resilience and Shock-Absorbing Capacity**—*catches the shuttle without bouncing; thus preventing filling thread from breaking or sluffing off bobbin.*
2. **Coolness**—*by running cool, the heat generated in catching and throwing the shuttle is dissipated more rapidly.*

For better, faster, more economical production, equip your looms with Gates complete line of *specially engineered* accessories... available from Gates Textile Distributors.

*Names supplied upon request.

Gates Distributors are in the YELLOW PAGES

The Mark of Specialized Research

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Take-up Roll Coverings
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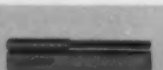
Spinning Frame Drives

Reversible Pickers



Tex-Hide Harness Straps

Thin-Tex, Vulco, Tex-Hide and Super Tex-Hide Lug Straps

4-in-one Chock Straps Multi-Chock Straps

Gates Textile Accessories

This Mill Is Brand New... and It's Off to a Running Start

EASY FLOW of materials is the key to Federal's new mill.

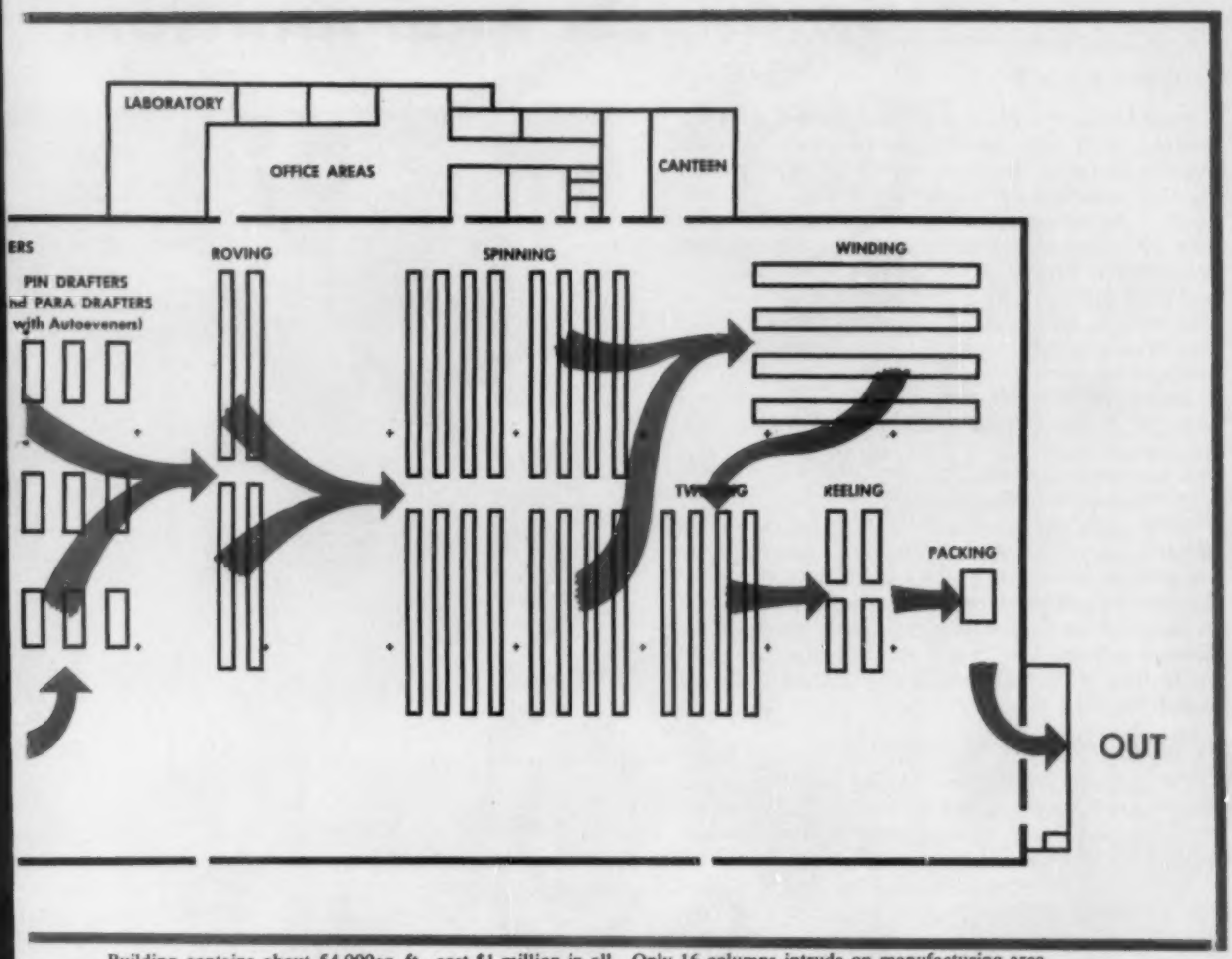
It was just a year ago that Federal Spinning Corporation got the idea for a new mill. Today, it's a reality. It's all-new, high-capacity, and flexible, too. Here's how Federal did it.

SEE THOSE BOLD, SWEEPING ARROWS in the diagram above? You're seeing a good idea in motion. You're seeing the end result of management teamwork that created this spanking new mill in just one year—from conception to full production.

This is the Sanford (N. C.) mill of the Federal Spinning Corp. It is turning out high-quality knitting yarn at the rate of 2-million lb. a year. From opening and blending (left) to winding, twisting, and reeling (right), material flows from one operation to the next with an easy assurance.

You don't turn out 2-million lb. of yarn a year by chance. It takes a vast amount of planning, a high level of technical competence, and, of course, the very best new equipment. Federal Spinning Corp. has all three. And, what's more, it has a management team that makes sure that a quality product moves out on time and at competitive cost—around the clock, five days a week.

Federal's new premium-quality yarn mill came into being because company management had a firm plan for selling the output. Because management had its



Building contains about 54,000sq. ft., cost $1-million in all. Only 16 columns intrude on manufacturing area.

engineering details worked out to the last square foot. And because the community of Sanford was more than willing to help the company make its bright idea take hard, profitable shape.

Bennett M. Berman, who heads up Federal Yarn Corp. (New York City) was the man who started the ball rolling. Plant Manager Carroll B. Little, Overseer Thomas J. Redmond, and Master Mechanic J. R. Barger Jr., are the men who keep it rolling.

It was Berman who just a year ago this month got in touch with Robert E. Pomeranz, president of Roberts Co., the Sanford textile-machinery manufacturer. Berman broached the idea of building a new plant to make use of Roberts' Short-Flo System for producing long-fiber yarns.

Berman's question was this: Could Roberts provide the necessary engineering cooperation to build a modest-sized yarn mill that could supply a portion of Berman's sales potential?

The answer came quickly—yes. Then Berman and Pomeranz agreed on three major principles:

1. Only premium quality yarn would be made.
2. Machinery and equipment would be carefully selected, and processes would be carefully engineered.
3. Production flow would be straight-line and would be set up in a modern building.

BUILDING THE MILL

Creating a fully modern mill in short order is never a simple task. But the cooperation of the Sanford Improvement Co. (which helped capitalize the plant) made Federal's job smoother. And the local pool of skilled labor also made the task of start-up easier. A total of more than $1-million was raised for the building and equipment, and, by November 1959 Federal signed its contract for construction. By mid-December 70% of the structural work was complete. A month later the riggers moved in to begin installing equipment. Then things really started popping. March 14 was the first day of operation, with a skeleton crew: Master Mechanic Barger, four spinners, three Turbo-Stapler operators, and two fixers. Just 10 weeks later—the mill was in full, around-the-clock operation.

. . . Turn the page

1. PREPARATION:

. . . *Begins on page* 30

Plant Manager Little and his management team are meeting their tight schedule because they have the building they need, they have the equipment they need, and they've trained the people they need.

When the first announcement went out for employees, over 500 applicants came to Federal. Management decided that experience in itself was not urgently necessary, because Little's team planned right from the start to train their men as they went. Potential employees took aptitude tests for manual dexterity and other attributes.

Both Plant Manager Little and Overseer Redmond have put in many hours training new workers, with two aims in mind:

1. Get into production fast.
2. Develop future supervisors.

Their goals got a favorable boost from the timing of hiring and of equipment installation. Because many key employees were on the spot when riggers installed the new equipment, they got a rare insight into the workings of the new equipment. (For example, the Roberts spinning and roving frames were built right on the floor of the mill while new employees looked on —and learned.)

ENGINEERING PLANT SERVICES

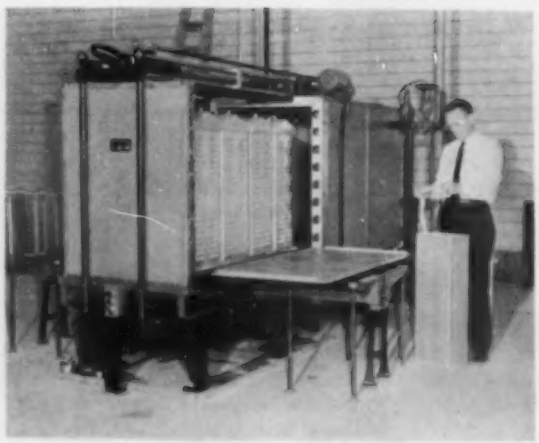
The mill plans to turn out 333 lb. of yarn per hour, 40,000 lb. per 120-hour week. Today, Orlon is the principal fiber. Soon to come: Dacron, Acrilan, Dynel, and others.

To back up that kind of production, Federal's management saw to it that it got the best sort of support from related services—like quality control, material handling, and lighting. Here are highlights of these three services:

Quality control—A complete laboratory (photo, p. 36) staffed by a qualified technician checks such things as boil-off (to determine bulking and shrinkage characteristics), average yarn quality, and the like. A complete Uster system (including a Spectrograph and an Imperfection Indicator) is in steady use. There are also blackboards, twist counters, yardage counters, and grain scales.

Material handling—To handle 8,000 lb. of incoming stock each day, a bottled-gas-powered fork-lift truck stacks tow boxes several high in the warehouse. Federal developed a special carrier with casters for handling and storing 40 balls of blended top after blending (and before the pinning operations).

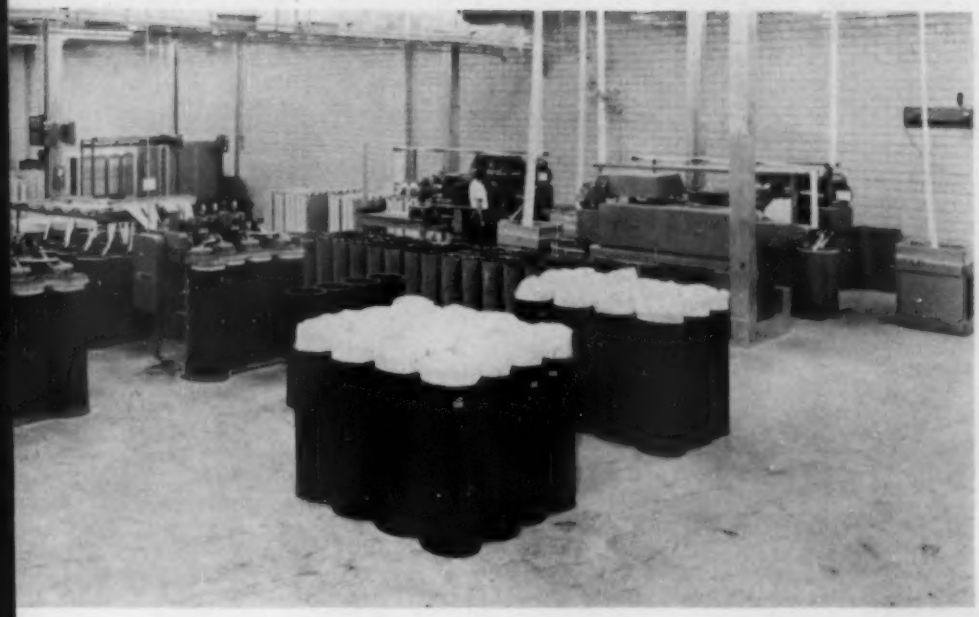
Lighting—The photos on these pages show you how bright Federal's new mill is. It's no mistake. Management asked for 50 footcandles at all production equipment. Fluorescent lamps provide illumination.



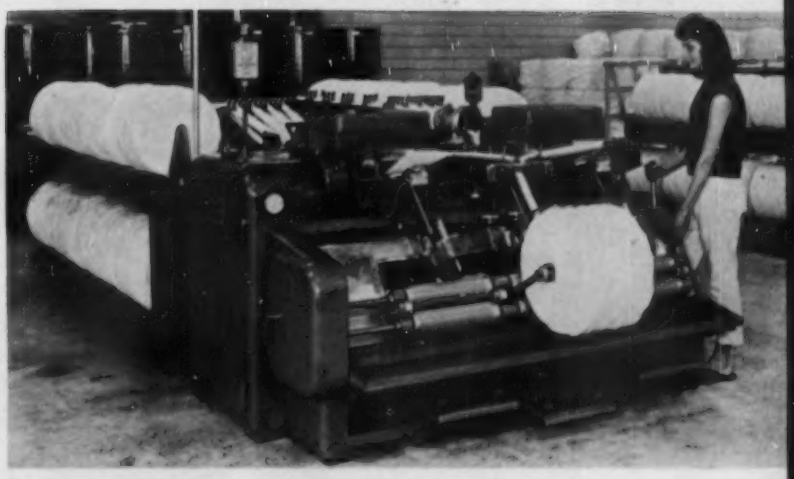
HEAT SETTING on this Turbo machine relaxes fibers for bulking properties. Here Plant Manager Little checks the 8-in. staple top.

DRAFTING takes place on Warner & Swasey Pin-Drafters or on Roberts-Tematex ParaDrafters. There are three series of Pin-Drafters: three machines each with a doubling of eight; three with a doubling of six; three with doubling of four.

OPENING AND BLENDING



START OF PROCESS FLOW is here. Turbo Staplers are in right background; pinning, drafting, and blending machines line up at left. Here the stock is parallelized, drafted, blended, and prepared for the roving frames. Turbo Staplers heat, stretch, and break the tow in a single process. Tow is drawn from Du Pont's original Orlon packing cases, is run through Stapler at 275° F.



PARALLELIZING, drafting, and blending fibers is next. This Roberts-Tematex ParaBlender does the job. Machine features a center ball delivery to blend a high number of slivers coming through the drafting zones on both heads. Nearby blending reserve area with 16 cans feeds each head of ParaBlender from different groups of stock. Delivered sliver weighs 360 grains per yard.

PARADRAFTING with AutoEvener follows the ParaBlender operation. Delivery is from eight balls. AutoEvener delivers one sliver automatically evened within ±1%. Delivery is in 24 x 30-in. cans.

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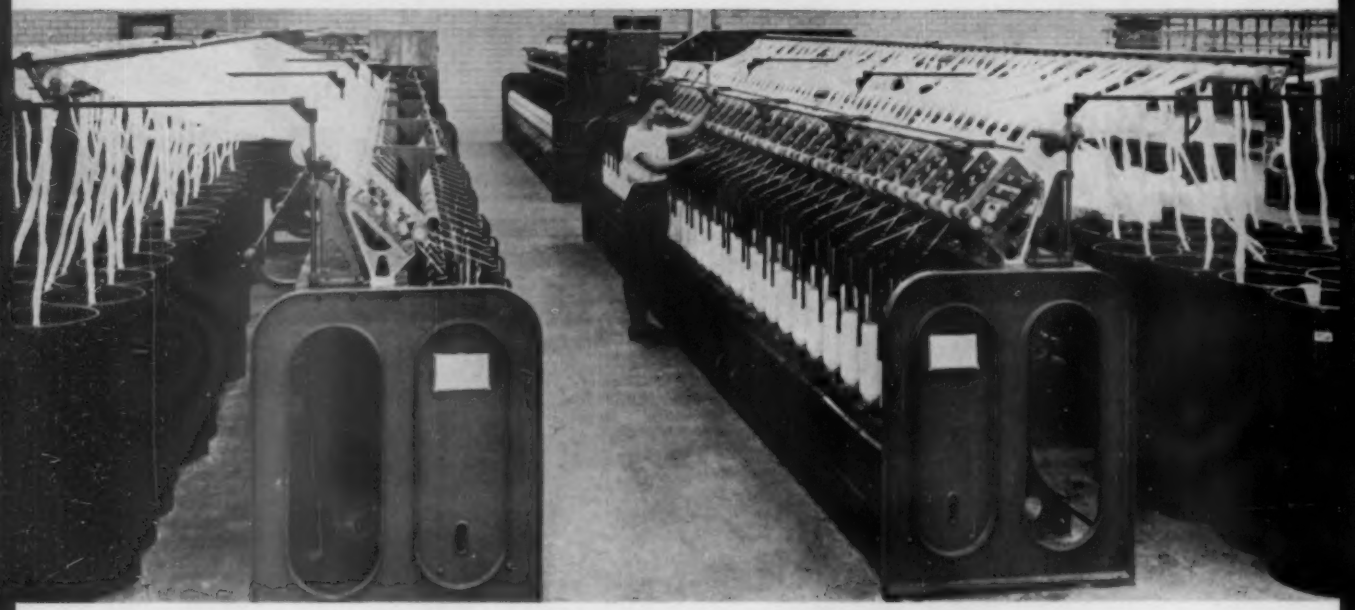
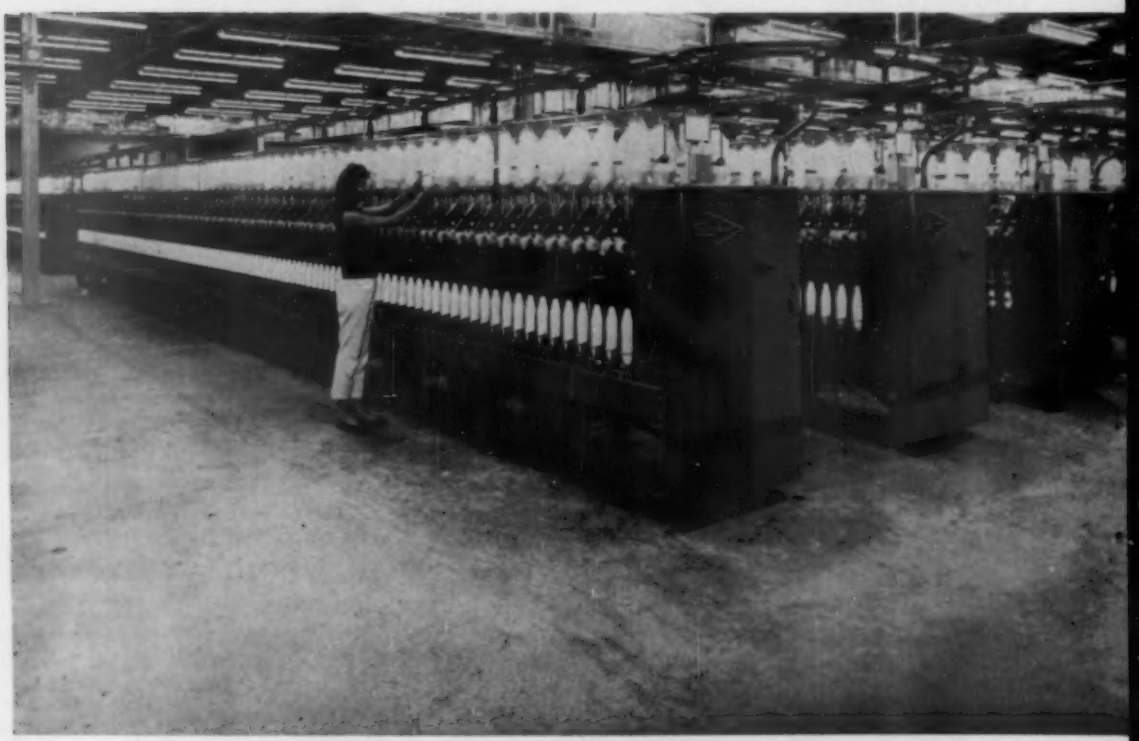


ROVING FRAMES at Federal feature high creels, big cans. Drafting system is mounted at 45° angle.

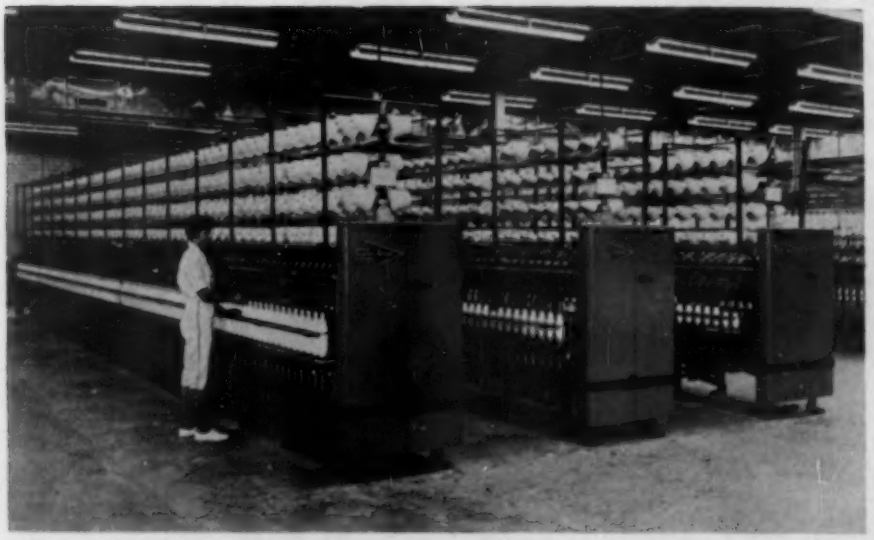
2. ROVING and SPINNING

SPINNING FRAMES are single creeled, can spin any kind of fiber up to eight inches long.



3. WINDING, TWISTING, and REELING

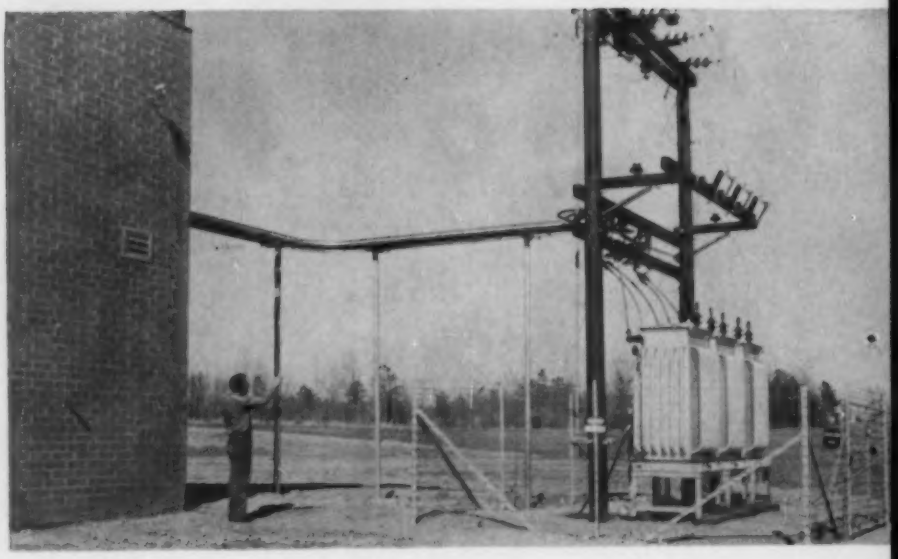
WINDING is done on two types of machines. This Leesona Roto-Coner is winding yarns for final shipment. Finished cones weigh four lb. Yarn numbers are 14s to 30s.



TWISTING is done on three Arrow frames that produce ply yarn to customer specification. Machines are Roberts TM-2 Twisters, with ball-bearing design for high-speed operation, minimal maintenance.

. . . Turn the page

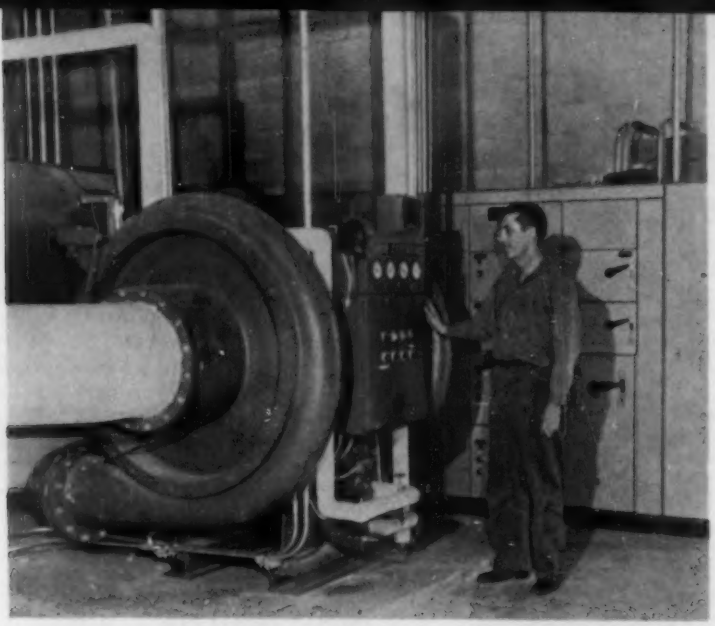
REELING is done on these Fidelity nine-head winders to produce 6-oz. skeins. Skeins can also be produced directly from the 12-oz. twister bobbins without rewinding on the winding machines.



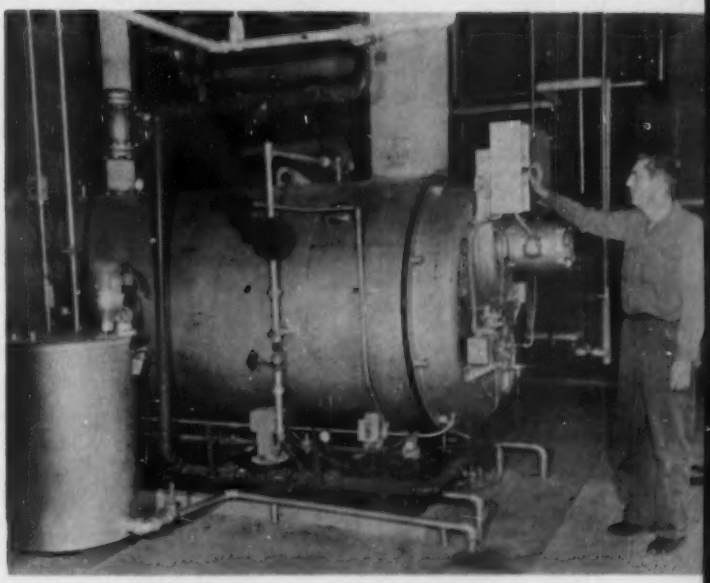
SUBSTATION that powers the mill features new open-type bus bars that are easily serviced in case of power interruption, other service requirements. Here Master Mechanic J. R. Barger, Jr., surveys substation.

4. PLANT SERVICES

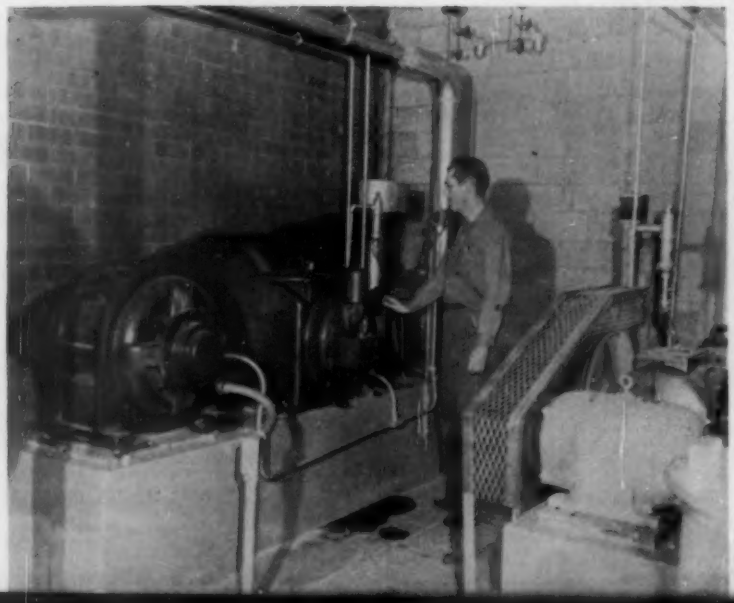
QUALITY CONTROL is the main job of this bright, clean laboratory.



AIR CONDITIONING unit is a Trane Centravac—has all controls in a single cabinet so that supervisors know at a glance what is going on. System switches to refrigeration automatically. Carefully engineered ducting throughout mill assures even temperatures and humidity at all times.



PACKAGED BOILER—and just one—serves entire mill, offices, and employee facilities. Fired by natural gas, boiler is automatically controlled. The boiler—Cleaver Brooks Model CB—is designed to fit only Federal's present needs, puts out 3,450 lb. of steam per hour.



COMPRESSOR (background) powers mill humidification. It's an Ingersol-Rand 12x9 model. A smaller 5x6 compressor powers air-operated machines in the mill.

The patent law has its quirks, as this expert explains. Truth is, you've got to be careful that a competitor doesn't make off with the fruits of your genius.

Protecting Your New Ideas

By V. ALEXANDER SCHER, Richards & Geier, Attorneys, New York City

SO YOU KNOW ALL ABOUT PATENTS AND TRADEMARKS? Maybe so. But knowledge alone isn't enough for the man who wants to protect his ideas and inventions. Fibers, yarns, and fabrics have a way of becoming public property unless the company responsible for their development takes steps to protect its interests.

The patent law is full of booby-traps—and patents and trademarks are only part of the story. Patents have been the foundation of many small and medium-sized businesses, including many textile companies. The importance of patents and the like to the textile industry is growing year by year (see panel, facing page).

But there's more to idea-protection than just patenting and trademarking, and you'll do well to inform yourself as fully as possible on all four important legal protections available for your creative designs, processes, and methods.

First step is to set up in your mind the clear distinctions between the four vital protective devices you can use:

- Patents—These cover inventions on machines or processes.
- Design patents—These cover visual inventions.
- Trademarks—These cover the specialized terms you use to distinguish your products.
- Copyrights—These protect descriptive or ornamental messages that you include on or with your product.

Old misconceptions have a way of lingering on. For generations people have confused patents, design patents, trademarks, and copyrights and have been mixed up about the respective values of each. Here, in a nutshell, are the basic facts about . . .

1. Invention Patent

Uncle Sam grants patents on inventions. But not all inventions are patentable. The Patent Act of 1952 defines a patentable invention as one pertaining to a machine, an article of manufacture, a process, a composition of matter, or improvements in any of the above. There are special patents that a plant can take out to cover its own special processes, also.

It isn't easy to obtain a patent. It's a complex and time-consuming job. In the first place, the Patent Office in Washington must carefully evaluate an application for novelty, subject matter, and form before a patent is granted. A patent runs for 17 years beginning with the date of the grant. Once those 17 years have elapsed the patent becomes public property and may be used by anyone. The only way to get your patent extended is to win a special act of Congress, but that is a rare occurrence.

2. Design Patent

Design patents (carefully distinguished from invention patents) are granted on new and ornamental articles of manufacture, including fabric ornamentation, lace, clothing ornamentation, and related articles.

The Patent Office also examines this type of patent application for novelty and form. But the evaluation is usually completed within a much shorter period for a design patent than for a patent of invention. You can take out a design patent for 3½, 7, or 14 years, whichever you prefer. But you must make your choice while the patent is still pending. Once the patent is granted you can't switch from a shorter to a longer term. And, like patents of invention, you can't renew a design patent.

3. Trademark

The Patent Office now grants trademark registrations under the Trademark Act of 1946. This provides extensive protection to trademark owners. An important requirement for registration is that the mark must have been used on, or in connection with, specific merchandise. Another requirement is that the trademark must show the origin or ownership of the merchandise.

Best trademarks consist of arbitrary words that are easy to pronounce, simple to spell, and pleasant to hear. The Patent Office won't register a trademark if it resembles an earlier mark too closely. If the mark is purely descriptive or relates to character or ability or a part of the country, it usually can be registered.

But the new act does say that if your mark has become associated with the trademark owner in the mind of the purchasing public through exclusive and lengthy use (not less than five years), you can register your mark.

According to another important provision of the new law, a trademark registration becomes unassailable after five years (except under exceptional circumstances).

Today the owner of a trademark registration granted or republished under the 1946 Act must submit

an affidavit to the Patent Office during the sixth year of the registration or republication, explaining that he is still using the trademark or that he has temporarily discontinued its use. (He must tell why.) Otherwise, the trademark registration is canceled by the Patent Office.

The 1946 Act also provides for registration of the same or similar trademarks by different parties under certain circumstances—for example, if they have been using them in widely separated localities. Collective marks used by members of an association and certification marks used to certify regional origin (or mode of manufacture) can also be registered under the new law.

An interesting provision of the Trademark Act is the possibility of registering service marks that are used to designate the services of their owners (distinguished from trademarks used on merchandise). A textile finisher, for example, can register his process under this provision. The important requirement for such registration is that the service must be rendered in interstate commerce, not confined to just one state. (Local businesses secure their registrations through the state registry office.)

Trademarks and service marks are registered by the Patent Office for a 20-year period. They can be renewed indefinitely for equal 20-year terms. The affidavit need be filed only once—during the sixth year of registration.

4. Copyright

Don't make the mistake of confusing trademarks with copyrights. Copyrights are an entirely different form of idea protection. The Register of Copyrights in Washington administers these rights. Most trademarks cannot be copyrighted, even if they are in the form of a slogan. But the Copyright Act does provide for the registration of prints and labels. The distinction the law makes between a trademark and a label is this: The label usually carries a substantial amount of descriptive and ornamental matter that does not serve the sole purpose of identifying the manufacturer. The trademark, on the other hand, is simply an identification mark.

If you print up your labels in artistic combinations of colors you can copyright the entire contents of the label, which distinguishes this type of protection from the much broader scope of protection that trademark protection provides.

You can't protect invention by a copyright, but you can protect some articles of manufacture, as well as design patents, by copyright.

The Register of Copyright grants copyright protection for 28 years. You can renew the copyright once for a second 28-year period. Because the Register of Copyrights does not examine the novelty of applications, they are usually granted a short time after filing.

The important feature of the Copyright Act is that the words "Copyright (year) by (owner)" must appear on the article that is to be copyrighted. You must take this step before you apply for the copyright (but after it has been published). Otherwise, you have dedicated the material to the public.

Don't confuse the Copyright Act with the Trademark Act in this respect. For if you claim that a trademark is registered when you have only applied for registration, you may find yourself in trouble with the Patent Office. The false marking of an article as being patented or "patent pending" is a federal offense.

Textile manufacturers have become more aware in recent years of the importance of copyrights in protecting their distinctive prints and designs. The courts have not hesitated to issue injunctions that forbid a competitor to sell a copy of your copyrighted fabric, for instance. If your competitor persists, the courts will invoke the criminal provisions of the Copyright Act.

Suppose you are troubled by imports of unlicensed merchandise that bears your trademark or a design that duplicates a design you have copyrighted. You can deposit copies of your registered trademarks and copyrights with customs officials through the Treasury Department. That way, you can stop this unauthorized use of your ideas.

You can get copies of any patent filed in the U. S. by writing the Commissioner of Patents, Washington, D. C. The price is 25¢. Copies of design patents and trademark registrations cost just 10¢ a copy. The Patent Office keeps a complete file of all patents of inventions.

New Textile Ideas—Highlights of 1959

Here's how Patent Attorney V. Alexander Scher sums up patent and trademark activity in the textile industry for a typical year:

"During 1959 the Patent Office Gazette published about 80 trademarks in Class 43, pertaining to yarns and threads, and about 400 trademarks in Class 42, pertaining to textile fabrics and substitutes thereof.

"Practically all important manufacturers were included in the lists of registration applicants. In the class covering yarns, about 35 trademarks referred to synthetic or man-made threads and yarns.

"In the class of textile fabrics and substitutes, over 100 trademark included fabrics made of artificial fibers. The second largest number of trademarks (40) pertained to cotton fabrics. Woolens were protected by 16 trademarks. (Other trademarks covered silk, asbestos, jute, and satin fabrics during the year.)

"As for design patents, manufacturers registered many important fabric designs during the year. One of the important registrants was U.S. Rubber Co., which secured no less than 15 design patents on breathable polymer-coated fabrics and 10 design patents on puffed textile fabrics. Puffed textile fabrics were also the subject of 18 design patents taken out by Chicopee Mills, Inc., of New York. Several chenille textile fabrics patents went to Scotland Mills, Inc., and Heritage Weavers, both of Laurinburg, N. C."

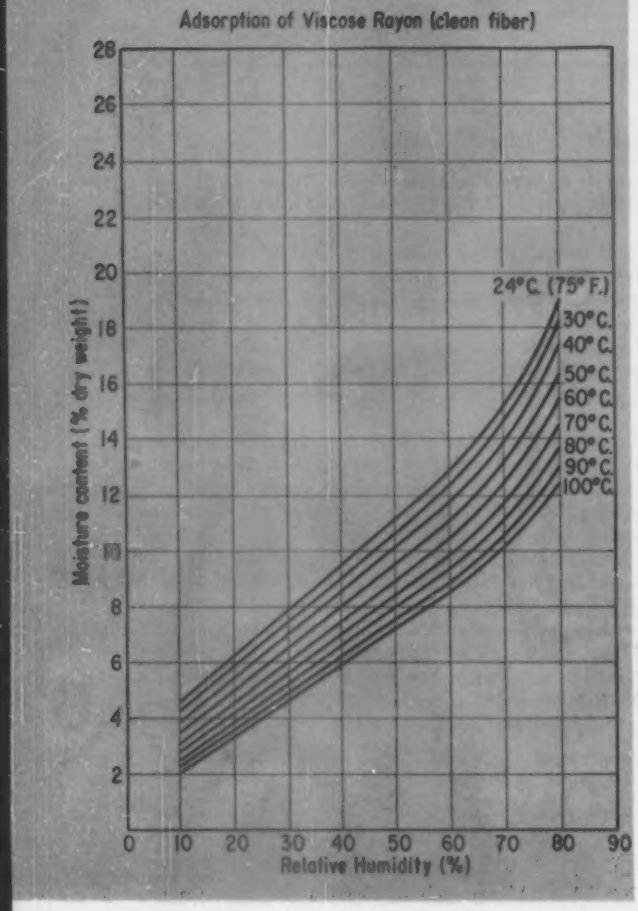


Fig. 1 MOISTURE REGAIN of viscose rayon is a standard 11%, which is attained by adsorption of 50% r.h.

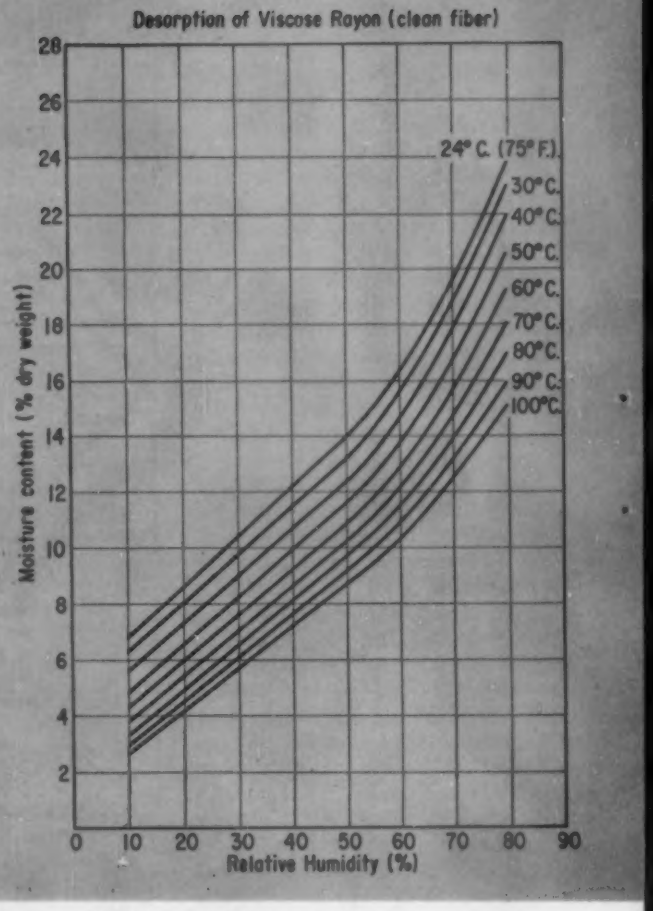
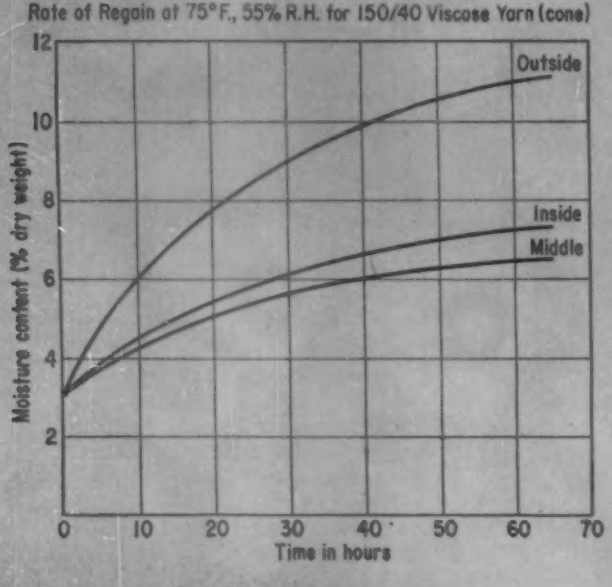
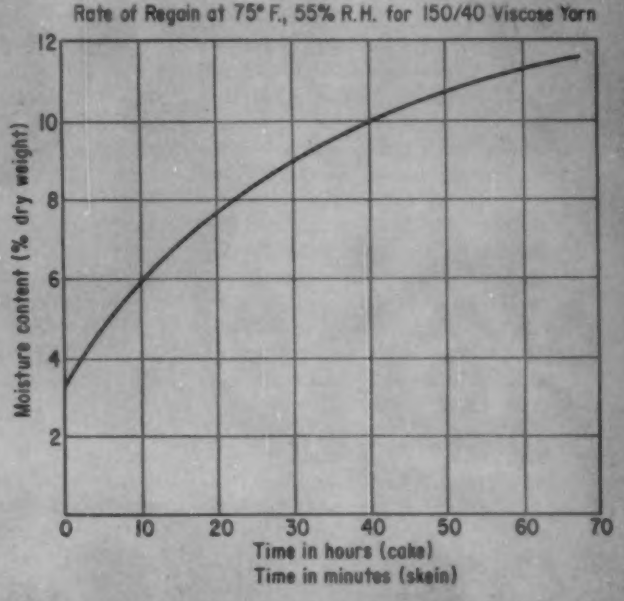


Fig. 2 MOISTURE DESORPTION values are greater than adsorption values, and hysteresis is different.

Fig. 3 MOISTURE ABSORPTION rate is affected considerably by put-up rayon. Type of put-up, relative humidity of air, temperature of air, circulation of air, and moisture content of material all affect moisture content.





Here's what you should know about...

MOISTURE and VISCOSE RAYON

MOISTURE IS A TROUBLE-MAKER when you're dealing with viscose rayon. Too much of it means more friction during winding —and therefore strained yarn. Too little of it, and the yarn gets stiff. But control it right, and you take a step forward in quality control.

That's what James G. Wiegerink, American Viscose Corp., recently reported to the American Society of Quality Control. To find out more about what he said, read the nutshell version of his comments below —and study the table and the charts on these two pages.

Viscose rayon, like all other textile yarns, interacts with moisture in the air. That is, it retains a given amount of water. How much it retains depends on temperature and humidity—but it's a great deal more than some other fibers, such as the acrylics and polyesters, will absorb.

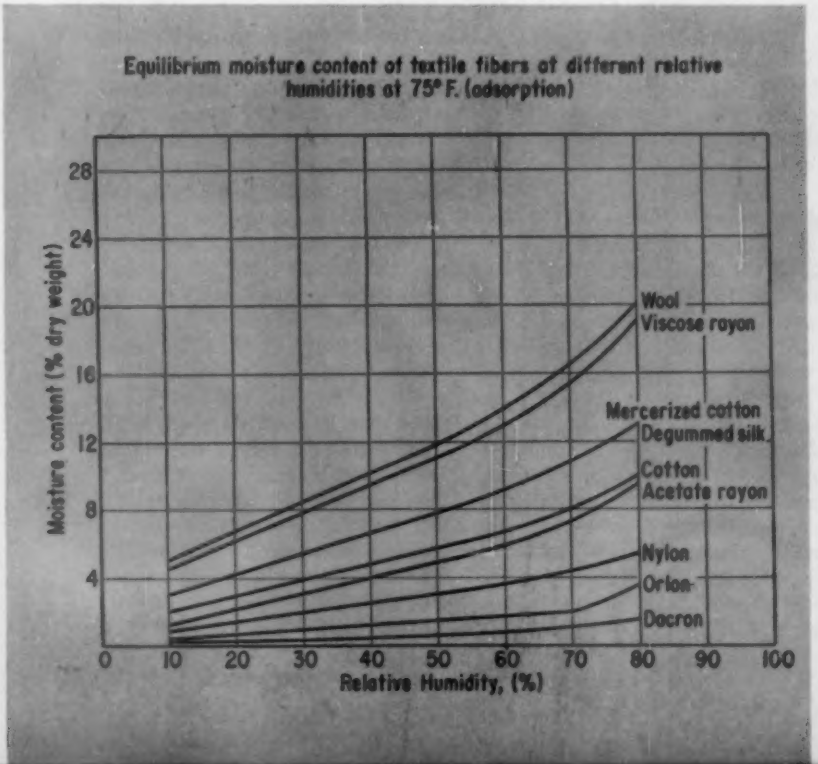
The charts on the facing page and below show basic data on the moisture content (regain) of viscose rayon in equilibrium with air at different relative humidities and at temperatures from 24°C. (75°F.) to 100°C. (212°F.). Equilibrium is approached from both the dry state and the wet state.

These adsorption data are the turning points in any operation that involves the conditioning of rayon. The equilibrium values represent the maximum amount of water that rayon can absorb at a specified temperature and humidity where the rayon is conditioned from the drv state.

The desorption data are important in drying rayon, because they define the moisture that is attained on drying the rayon fiber from its wet state at a specified temperature and relative humidity. The desorption moisture values are greater than the adsorption values. The difference is in the familiar hysteresis (lagging) effect. The first chart (Fig. 1) shows that the standard condition of 11% regain of viscose rayon at room temperature (75°F.) is attained at about 50% relative humidity (r.h.). For 58% r.h., sometimes regarded as a standard-conditioning humidity for viscose rayon, the equilibrium moisture (dry-weight basis) is 12.5%. It is 14% at 65% r.h., the standard for acetate and cotton.

Fig. 4 MOISTURE ADSORPTION ability of viscose rayon is higher than for most other fabrics. Too much moisture causes friction, too little means stiff yarn.

REGAIN AND SWELLING, as shown in cross-sectional data, don't correlate.



FIBER REGAIN AT 75° F. BY ADSORPTION

Textile fiber	50% R.H.	65% R.H.	Cross-sectional Swelling (Wet)
Wool	11.8%	15.2%	35%
Viscose rayon	11.0	14.0	100
Mercerized cotton	7.8	10.0	40
Silk (degummed)	7.8	10.0	30
Cotton	5.7	7.2	95
Acetate	4.8	6.5	15
Nylon	3.0	4.0	5
Orlon	1.5	2.0	0
Dacron	0.5	1.0	0
Polypropylene	0.5	1.0	0

WHAT TEMPERATURE DOES

Not everybody understands the effect of temperature on regain. For identical relative humidities the regain decreases with increasing temperature (see Figs. 1 and 2). Reason for the misunderstanding is that for the same relative humidity the moisture-holding capacity of the air increases rapidly with temperature. Some people reason mistakenly that the rayon, acting like a sponge, soaks up more water. Fact is, as temperature goes up the rayon releases water more readily than it absorbs it.

Now look at Fig. 4. It compares the regain values of viscose rayon with other textile fibers. A comparison of the moisture-adsorbing ability of various fibers is given in the accompanying table.

Wet cross-sectional swelling data indicate that there is no absolute correlation between regain and swelling. Viscose rayon with a wet cross-sectional swelling of 100% is in a class by itself. Wool, cotton, and silk have about the same swelling values—30 to 40%—but they range widely in regain. For example, wool has a regain of 15% compared with cotton's 7% at 65% r.h. The acrylics and polyesters have little tendency to swell in water and have low regains.

Regains for textile fibers in their pure form, with no extraneous materials such as oils or finishes, are standard the world over. Cotton grown in Egypt, for example, has an adsorption regain of around 7%, the same as for cotton grown in Alabama.

This characteristic is also true of viscose rayon, of which there are many types manufactured in many ways. Regains of regular-type viscose rayon and acetate are independent of the method of manufacture and of the manufacturer, foreign or domestic. But special types of viscose rayon and acetate do have different regains.

Certain treatments and extraneous materials affect to some extent the moisture pickup of viscose rayon and acetate. For instance, addition of dulling oils to viscose rayon will reduce water intake slightly. Overheating or overdrying will reduce regains to some extent. But loss in other properties such as strength and dyeability is much more pronounced than the slight loss in moisture adsorption. Sizing materials, such as certain types of gelatin that have a greater ability to adsorb moisture than the rayon itself, will increase regain values.

HOW REGAIN VARIES

The rate at which a textile material attains the moisture content at equilibrium is of practical importance in manufacturing. This rate depends upon five factors:

- Type of put-up.
- Relative humidity of the air.
- Temperature of the air.
- Circulation of the air.
- Moisture content of the textile material prior to conditioning.

Rates of regain for viscose rayon (as shown in Fig. 3) are a function of put-up. There is a tremendous difference in these rates. For example, the inside and middle of a cone, even after days of conditioning, show only a slight increase in moisture. On the other hand, fine-denier staple adsorbs moisture from a dry state in minutes of conditioning time when it is placed loose in a conditioning atmosphere. A small skein adsorbs moisture at a much greater rate than a cake of similar denier.

Only the outside of tightly wound packages in contact with the conditioned atmosphere regain from a dry state to the required 10 to 12%. The reverse is also true. The outside of these tight packages with a proper 10 to 12% regain will dry out easily if the atmosphere has a low relative humidity.

Raising conditioning humidities much above 55% at 75° F. to provide a faster regain rate is tricky, for if the conditioning time is not controlled your regains may be too high. This means that relative humidity offers little flexibility as a means for effecting rates of regain.

Regain of staple and cakes increases with increase in temperature. But temperature of conditioning offers little opportunity for changing regain. To provide for proper working conditions at the conditioning atmosphere of 55% r.h., you must have moderate dry-bulb temperature in the narrow range of 75 to 85° F.

Normal air circulation in textile plants with air conditioning is below 75 ft. per min. Special conditioning units can increase the rate of conditioning by providing air circulation in a range of 200 to 500 ft. per min. Also, you can operate these units at high temperatures and humidities and this makes possible the proper conditioning of tightly wound packages.

NEEDED: LOW STRESSES

Where textile yarns are handled in winding, warping, and weaving, extensibilities and strengths at break are not directly applicable because in these processes stresses are kept down to a level that will allow completely reversible stretching. Overstretched rayon gives noticeable defects in the finished dyed fabric. An extension as low as 0.5% in the processing of viscose rayon is enough to produce satisfactory fabrics if the rayon has the normal 11% regain.

Viscose rayon can stand a stretching force of 0.5 gram per denier in winding, weaving, or warping without creating dyeing defects such as shiners, strained ends, etc. But this condition is only correct at normal regains, no higher than 12%. At 15% regain, the maximum force is half of the 0.5 gram per denier. This 15% regain is the equilibrium moisture value for rayon at 70% r.h. And in mills where rayon is processed alongside natural fibers and where humidity control is inadequate, a 70% r.h. is not unlikely.

Increasing the moisture in viscose rayon and acetate increases friction during winding. Types of guides and their finish are important because as the yarn gets moist it gets softer and offers more surface for drag across the tension guides. As the yarn gets less moist, it becomes stiff and offers less surface for drag. This way friction decreases.

For specific end uses for viscose-rayon yarn, a certain amount of increased softness caused by increasing the moisture above normal is desirable in such operations as knitting, braiding, and twisting. But increasing moisture much above the normal 11% regain creates a strong possibility of strained yarn and all its complications.

Clues to Better Air Conditioning

TEXTILE WORLD sat in on the spring meeting of the South Carolina Division, Southern Textile Association, heard panel members, mill engineers, and mechanics talk air conditioning. One run-down stood out. Here it is.

What does a mill engineer expect from his air-conditioning system? How closely must he control temperature and humidity? How does he keep his mill system operating correctly?

TEXTILE WORLD editors took notes on an off-the-cuff discussion among panel members of Southern Textile Association to get answers to these questions. And here is the best statement we heard. Listen, while the engineer of a 90,000-spindle, 2,600-loom mill tells you how to get the most from your own air-conditioning system:

The only way to control ends down in spinning is to keep relative humidity constantly within ± ½%. For this close tolerance, of course, you must have a refrigeration system. That means refrigeration throughout most of the year.

Fact is, we've never had an eight-week period that we haven't used refrigeration. We run our central-station refrigeration unit through half of November. Refrigeration starts automatically when the temperature goes to 62° F. We keep relative humidity at 42%. Spinning frames have vacuum waste removal.

THE KEY: DEW POINT

Dew point is the criterion in controlling relative humidity in a spinning room. We don't care about outside air. And we never add outside air. Instead, we continuously filter, wash, and recirculate.

We use steam all the time with refrigeration to control humidity—even in August. This costs us money. But it gives us what we want in atmospheric control. We can generate 20,000 lb. of steam per hour, and we get 9.5 lb. of steam per pound of coal.

Our spinning room is ideally laid out for atmospheric control. The room is 125 ft. wide. Therefore two spinning frames placed end to end fit across the room with the 550-v. motors on the outside. This way, motor heat dissipates through the exterior walls, so our heat load is low.

But when motors are distributed throughout a spinning room, you need exhaust fans or some other means of dissipating heat. An exhaust fan with a duct under the spinning room is one good way to remove excessive heat. Without a fan you'll be doing well if you hold the atmosphere within 5° F. (dry bulb).

FREQUENT READINGS

At our mill, a man reads each recorder every two hours. He records these readings. This way, we keep a constant check on temperature and humidity.

We have four air-conditioning units in spinning. (When one unit is out, we really have trouble. We'd like to have eight for flexibility.) One unit has a capacity of 450 tons. But because all our units are three to six years old, this large unit has to have 50% of a load to operate.

The newer units operate on only 10% of a load. For filters we use perforated V-type paper.

One weave room (650 x 130 ft., with 728 X-2 looms) has air-washing equipment, but isn't refrigerated. Unit capacity is 185,000 cfm. The washer is a 50-in. unit.

HUMIDITY JUST RIGHT

Temperature is 80° F., and relative humidity is 86%. We make a correction if the relative humidity varies 1½% either way.

In this weave room we measure relative humidity with a battery-operated sling psychrometer at 65 positions. The room has four air washers and no outside ventilators.

We do all maintenance of air washers on weekends. We clean filters every week. We've tried cleaning them every two, three, and four weeks. But the one-week cleaning cycle is best.

We aren't bothered with algae, and we don't use a great deal of chemicals to prevent it. We remove lint from the washer once a week and bleed the water often. We sanitize the system three times a year.

All eliminators are stainless steel. We've removed all strainers, and we've boxed up all back baffles so that we have only eliminators left. We drain the washers weekly and wash them with a hose. We use a detergent a half-hour before a washer is closed down for cleaning. Almost any commercial detergent is good for cleaning—we use Vel, Tide, or Joy.

LONG-LASTING PAINT

We installed our system in 1947. Until three years ago we painted the 12-ft., 75-hp. fan every year.

At that time, we sandblasted the fan and gave it four coats of special paint, each a different color. The paint can be either brushed or sprayed on. The paint is still in prime shape.

There are 1,700 spray nozzles, but we don't need all of them. We have removed nozzles only once for servicing. We're now changing all of these from bronze to rubber.

Ten men maintain the entire air-conditioning and humidifying system in our mill. One of these men is foreman. This maintenance crew works only on one shift, but it works one more day each week than the plant operates. Therefore the vacuum end-removal system and the central-station air-conditioning system are cleaned each weekend.

New Carding Boosts Yarn Quality

To slash nep count, lower costs all around, Beaumont Division of Spartan Mills (Spartansburg, S. C.) finds that metallic clothing (photos, facing page) is just the thing.

"REDUCED NEP COUNT—DOWN 30 TO 40% ON THE AVERAGE—is probably the most important single result of installing metallic card clothing at Beaumont," says Superintendent J. L. Adams.

And that's not the only benefit Beaumont enjoys. Yarn quality is higher on all counts: It looks better, has a higher breaking strength, and is more even. Finally, there are big savings in strips, stripping costs, and production.

Superintendent Adams isn't a man to tell just half a story. He goes on to point out that three different cotton mixes made into 55.3-grain sliver on the 40 metallic-clothed cards have only 6 to 8 neps per grain. The other 261 cards, running on the same mixes, produce 10 to 15 neps per grain.

Cotton mixes used at Beaumont are made from 1- and $1\frac{1}{32}$-in. Middling and better, Bright Strict Low Middling, and Low Middling. Here's how new and old methods compare:

- The 21.25s filling made with roving from metallic clothing has an appearance grade of B+ and a break factor of 2,171. (The same size yarn made with regular roving has an appearance grade of B and a break factor of 2,108.)
- Brush evenness is 118.6% for the metallic clothing, compared with 121.3% for the fillet.

SAVING: $200 PER CARD

As to the saving in strips, all the fillet-clothed cards are traverse-stripped three times per shift. The metallic-clothed cards are stripped once a week with a hand roller, mostly for burrs and seeds. Good cotton saved by reduced stripping amounts to $200 per card per year for the metallic clothing.

Stripping of the fillet-clothed cards requires up to 3 min. per traverse, or 27 min. for a 24-hr. day. This machine stoppage means a production loss of about 5 lb. per card, more than 1,305 lb. per day for the 261 fillet-clothed cards.

Added to this saving of production loss is a production gain resulting from higher operating speeds. The metallic-clothed cards produce 10 lb. of sliver per hour, 2 lb. more than the fillet-clothed cards running the same stock. Cylinder speed is 178 rpm., and flat speed is 3 in. per min.

Most of the settings for the metallic-clothed cards are the same as for the fillet-clothed machines. But certain plate settings have to be closer to keep air currents from blowing fly back into the work.

Here are the settings used at Beaumont:

Setting	Fillet	Metallic
Doffer to cylinder	0.007 in.	0.007 in.
Flats to cylinder	0.010	0.010
Lickerin to cylinder	0.007	0.007
Feed plate to lickerin	0.010	0.010
Doffer comb to doffer	0.022	0.017
Back screen	0.022	0.017
Bottom screen	$\frac{1}{16}$	$\frac{1}{16}$
Front screen	$\frac{3}{16}$	$\frac{3}{16}$
Top front plate	0.034	0.034
Bottom front plate	0.034	0.010
Top back plate	0.029	0.017
Bottom back plate	0.034	0.022
Lickerin screen	0.034	0.034
Top mote knives	0.012	0.012
Bottom mote knives	0.010	0.010
Flat comb to flats	0.022	0.022
Angle of mote knife	13°	13°

Card grinders check settings on half of the cards every 12 days. They complete the cycle in 24 days. Flats are checked on the first inspection, lickerins on the second round. Drive belts are dressed once a week and taken up as necessary. All but the slow-moving parts of the card are oiled every 24 hr.

The card tender mops the cards once a day, wipes fronts twice, sweeps the floor and alley twice, removes fly every 8 hr., lays in laps, doffs cans, and hauls the sliver to the drawing frames. Assignment is 48 cards per tender.

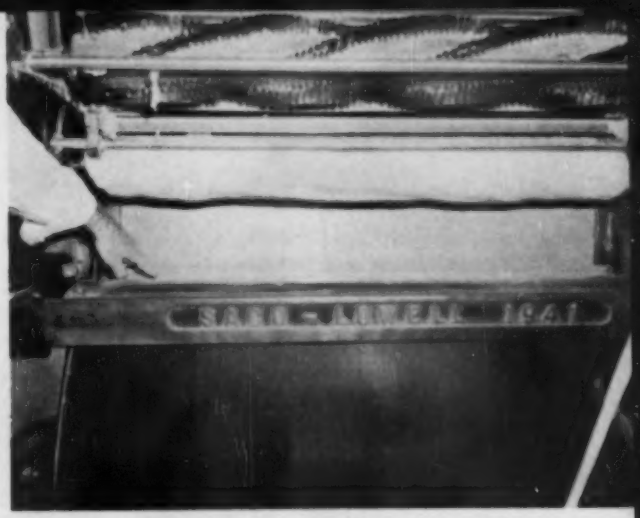
COST IS $750 PER CARD

Hollingsworth metallic clothing was mounted on the 40 cards at a cost of about $750 per unit. The clothing has an aluminum base and weighs about 590 lb. per card, much less than earlier types.

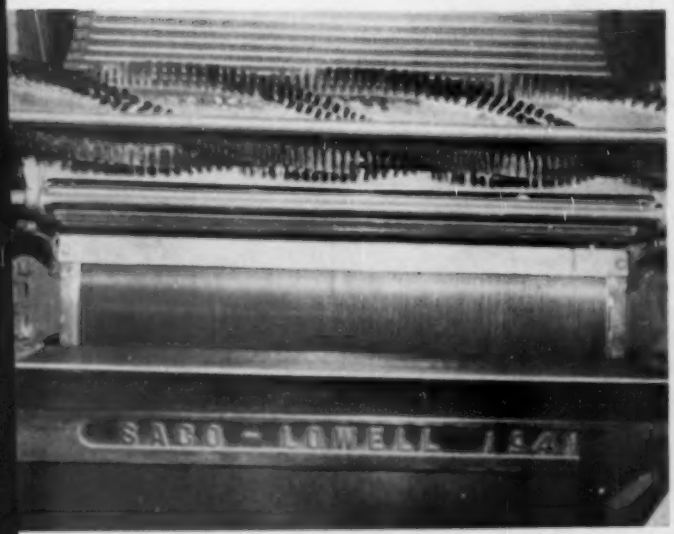
Work was done by J. D. Hollingsworth & Co., Greenville, S. C., where the machines were checked over for worn shafts, bad bearings, and other potential causes of trouble. Every possible adjustment or repair was made to assure perfect balance before the cards were returned to Beaumont.

Present plans are to put metallic clothing on the 261 fillet-clothed cards as the old clothing wears out.

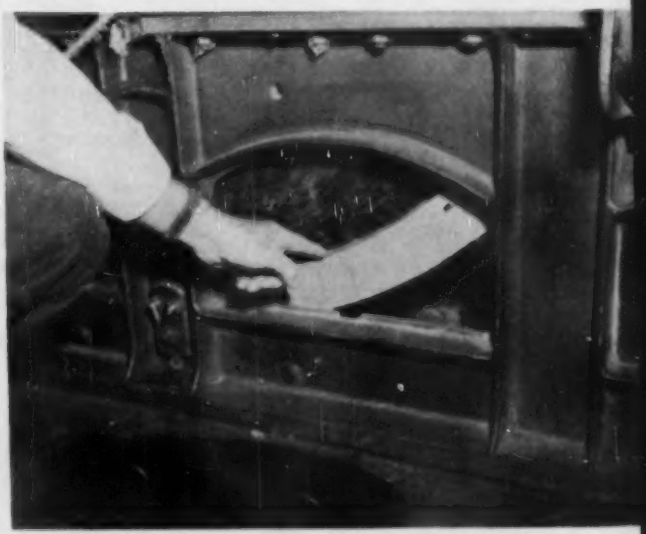
CLEAN WEB produced by metallic clothing is checked by Carding Overseer J. L. Jordan as he makes his daily inspection.



CLOSER PLATE SETTINGS between the doffer and cylinder stop line and fly from blowing back under the doffer cap.



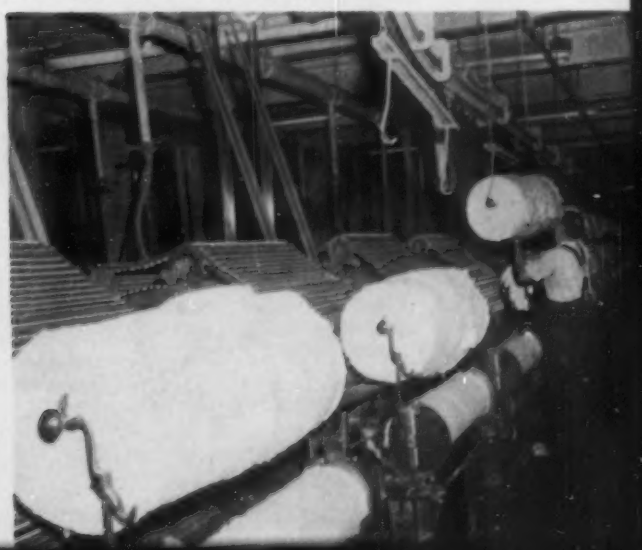
WIRE IS CLEAN after a steady run of six days without stripping; fillet is stripped three times per shift.



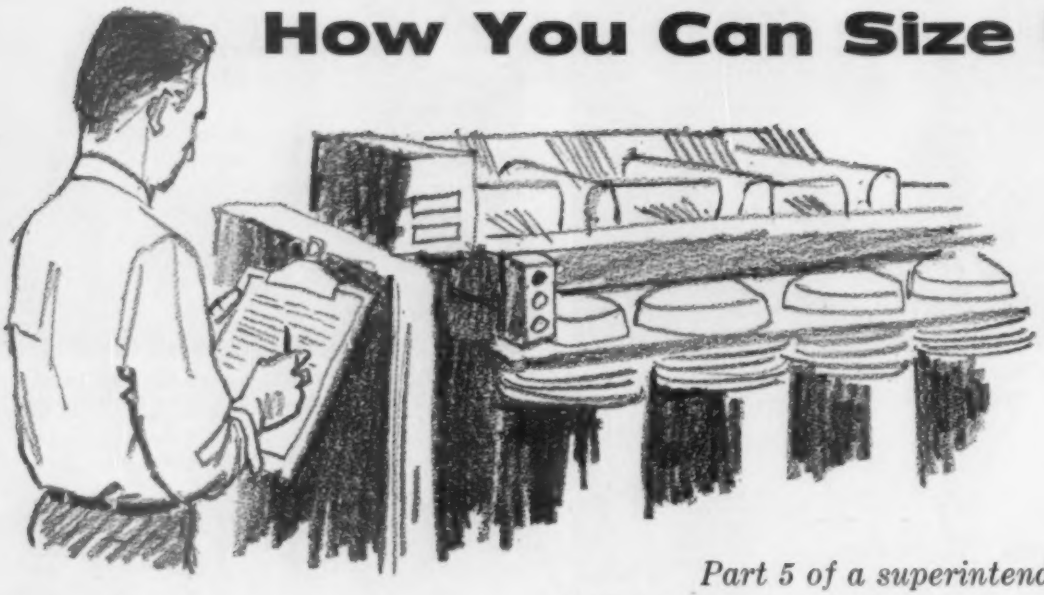
SCREEN SETTING TO CYLINDER and spacing at each side of cylinder are set closer to cut down on air currents.

SPRING WEIGHTS on the back feed roll are carefully adjusted to prevent lumps from entering the card.

LAP CONVEYOR installed along with the metallic clothing has cut handling cost $10,000 per year.



How You Can Size Up



Part 5 of a superintendent's daily inspection is drawing—one of the simplest operations in the mill. But don't take drawing lightly. There are danger points. Things like sliver variation, web tension, and jerky coilers.

By A. L. LANDAU, Assistant General Manager,
Replacement Parts Div., Saco-Lowell Shops, Greenville, S. C.

YOU'RE A BUSY superintendent with a lot of territory to cover in the mill. You've already inspected four important operations and you're ready, now, to look in on the drawing department.

Perhaps just before you go into the drawing operation for a look-see you sum up the inspection job you've done so far that day: You've seen cotton-mixing, opening and cleaning, picker-room, and card-room operations.

When you completed your daily check of the cards (your last stop on your mill inspection tour (TEXTILE WORLD, May, 1960, p. 248)), you noticed that the quality of the card sliver appeared to be clean, even, and up to standard. You noted the new large coilers and cans. You saw that cans of sliver were not being doffed too soon. Nor were they being held in the coiler until the sliver variation was damaged by excessive packing.

So far so good. (Evidence from cost studies tends to prove that the greater length of sliver per can is directly related to reduced productive costs through—and only through — reduced work loads. Creeling of breaker drawing, for example, normally represents over 20% of the drawing work load.)

CANS: CLUE TO TROUBLE

If your mill is properly balanced with adequate work loads, it is essential that the card cans be properly filled, or work assignments will get out of balance. Thus you are safeguarding production and smooth operations at both drawing and carding by insisting that the operators fill the cans correctly before doffing. You also are protecting quality by preventing cans from overloading.

As you walk toward the drawing frames, watch for a clue to the general efficiency of the operation: placement of the cans, both empty and full. A careful operator holds out extra-full cans and deposits empty ones in neat lines. He leaves ample space to prevent cramping the working area.

A glance into the cans as you pass by shows whether they are being run out completely, or whether the bottom portion of the sliver is being broken off. To creel more cans at one time, operators often leave bottom layers in the can. This practice increases the amount of reworkable waste and causes excessive piecings that mean trouble in drafting at roving and spinning.

Another quick look shows you that things are going well. Why? Because:

- The cans are creeled properly to prevent sliver from dragging and stretching . . .
- The cans are not placed too far from the back rolls . . .
- The slivers do not tangle.

Drawing-Frame Operations

The inspection so far has taken only the time required to walk toward the drawing. You have picked up a great deal of information in less than a minute. You can assure yourself that the handling of the sliver is generally correct up to the back of the drafting element of the drawing frame.

DELIVERY END FIRST

Your next move is to walk to the front of the first drawing frame. Always observe the delivery end of the machine first because this action saves time and speeds up the daily inspection. If the product at the delivery end is satisfactory, the machine is probably operating correctly.

If the sliver is not up to standard and you can see the defect, you —as a trained technician—should be able to narrow down possible causes to a very limited number. This sort of immediate detection and analytical approach, based on sound practical experience, is a skill that any superintendent must have to keep his mill running at peak efficiency.

DRAWING: SIMPLE BUT VITAL

The drawing frame is the simplest machine in the spinning mill. It is also one of the most important in its effect upon the evenness of sliver, roving, and yarn. This is especially true today because the reduction of intermediate roving and multiple drawing has placed a greater demand upon the single- or two-process drawing frames. Today's machines have to accomplish a better degree of evenness than was formerly produced in a long sequence of operations.

Drawing reduces the yarn variation per yard. At the same time it increases the inch-per-inch variation. This is a characteristic of any roll-drafting element. For this reason, you'll want to pay special attention to the drafting section of the drawing frame and to the tension gearing as well. Also you'll look for lint accumulations which are almost certain to ruin sliver quality —and you'll want to keep your eyes peeled for other signs of trouble, such as intermittent motions that affect variation.

WEB: AN INDEX OF QUALITY

No time to waste. You want to shoot trouble fast—if there is trouble. So you examine the first head of drawing. It's your fastest clue to trouble. The web is the first indicator of quality. The appearance of the thin film of spread fibers provides accurate clues in judging the correctness of roll settings, the proper break-up of drafts, and the degree of tension between the front rolls and the calender rolls. The web is your visual indicator of uniformity, which cannot be measured precisely except in the laboratory.

The spread of fibers across the width and length of the web as it travels to the calender rolls should be evenly distributed. Bars of thick and thin places tell you that some mechanical halting motion or incorrect roll setting is causing excessive variation.

Stripes running lengthwise in the sliver with partial separations of the original back sliver are a sign of insufficient sliver thickness or too much distance between the selvage guides. Insufficient sliver mass can come from either of two courses: improper planning of drafts and weights, or failure to creel in the correct number of sliver cans at the back of the frame.

PUSH DOWN ON FIBERS

Your next move is to lift up the cover and watch the drafting rolls. This action gives you an opportunity to check the cleanliness of the clearers and condition of the rolls. With the frame stopped, push down on the fibers between the rolls and sense from the pressure whether the rolls are set to suit the staple being processed. A pull at the end of the rolls tells you whether the weight hooks or pressure arms are free of binding and whether the full weight of the pressure system is against the top rolls.

With the cover down and the frame running, your next check point is the tension of the web. Web tension is vital to evenness. It must be carefully regulated. Bear in mind that any number of factors can cause a wide change from original settings.

A practical technician generally checks web tension by pressing down the web with a smooth rod and then watching to see how long it takes it to regain its original tightness. If the web is running too slack, make a quick check of the roll covering of the front top roll, the gage of the hole in the calender trumpet, and the roll-weighting system.

Slack tension is the end result of insufficient weighting, worn trumpets with oversized holes, or top rolls worn hollow. If all deliveries of the drawing head show the same slackness in the web, then you may safely assume that there should be a change in the tension gear that regulates the relative speeds of the front rolls and the calender rolls.

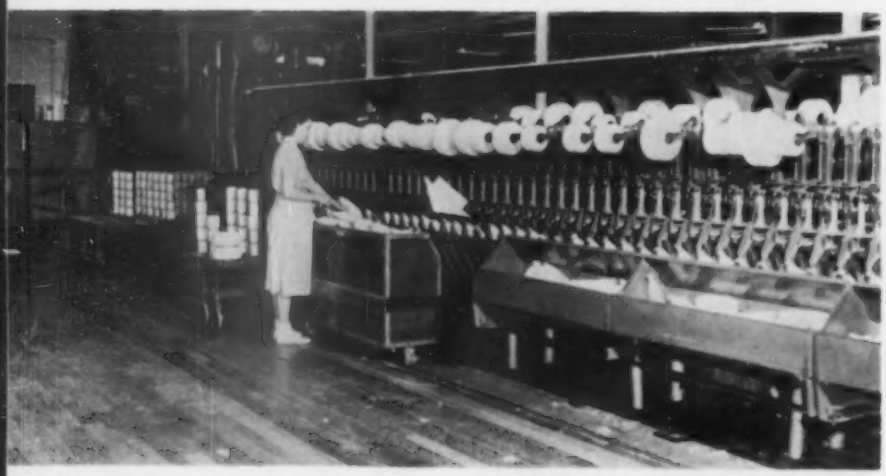
Now step back from the drawing frame and watch its front end for a few minutes. The coilers should be rotating smoothly and without intermittent jerks. A jerky coiler will coil the sliver poorly and cause high evenness variation because of sliver stretchage.

Wait for the doff to assure yourself that the cans are being filled completely without over-running. This inspection is similar to your recent check at the card coilers and for the same reasons. Finally, break down an end to make sure that the stop motions both in front and in back of the drafting element are working correctly.

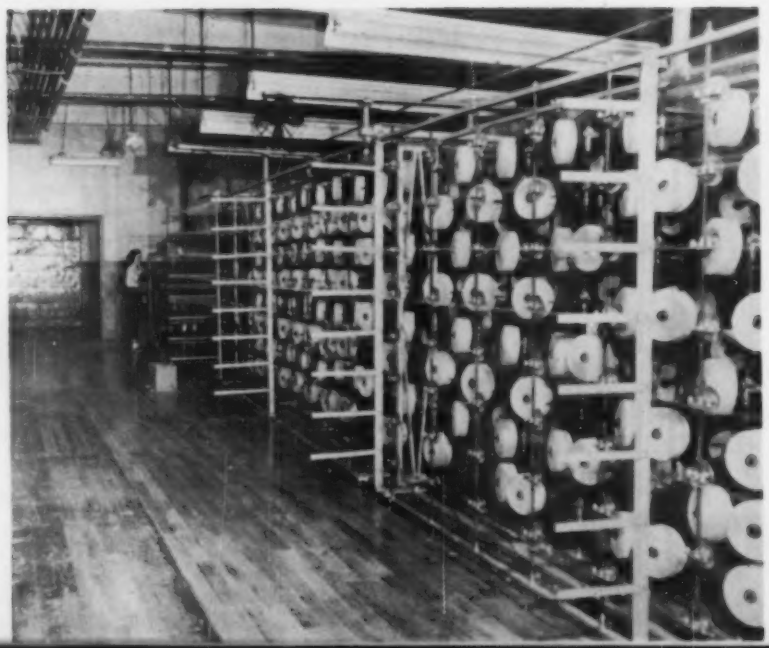
You briefly watch each drawing frame in the room. But you spend considerable time inspecting one particular head. Each day you closely examine a different head so that in time you will have thoroughly checked each head and each delivery in the room. This procedure is a major operating technique. And it indicates to management that you know your job and are on top of it at all times.

If your mill operation is typical, chances are your warp-yarn preparation equipment is scattered over most of your spinning department. Swift Mfg. Co. had just that problem. Here's how the company solved its problem and boosted over-all efficiency 33%. The Swift story reveals the . . .

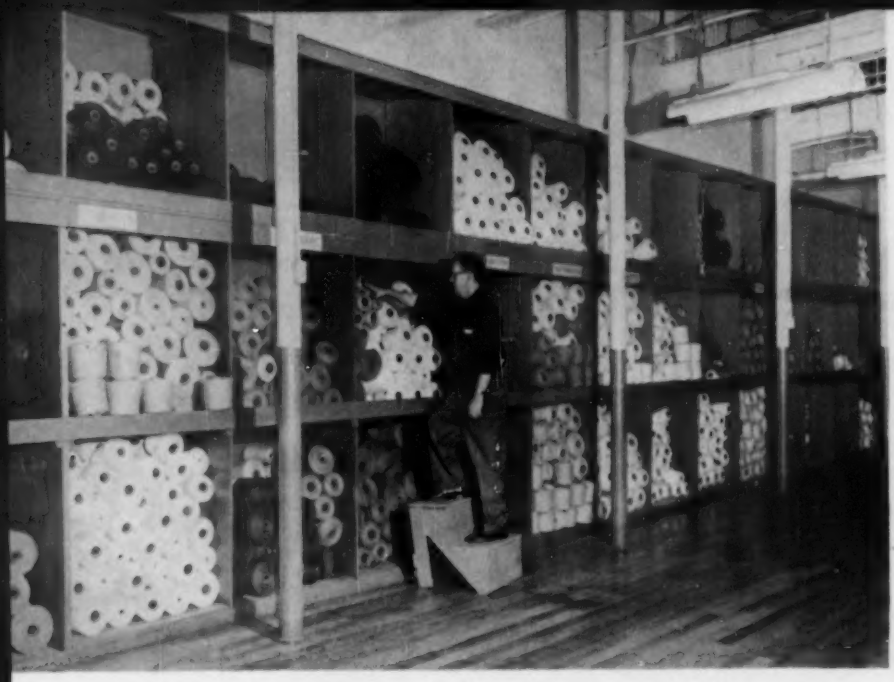
Newest Trends In Warp-Yarn Preparation



NEW TRUCKS (arrow) at spoolers replace the troughs formerly used to hold spinning bobbins. Bobbins are doffed into the trucks at spinning frames, and the trucks are rolled to the spooler. A spring-loaded platform in the truck keeps bobbins at the operator's finger tips.



SPECIAL WARPER for continuous-filament nylon and other manmade fibers is placed in a room by itself to protect yarn from flying lint of other fibers. Special equipment includes a static eliminator, drop wires, and tension weights. Average speed for all yarns is 350 yd. per min.



SELVAGE-YARN STORAGE extends through half the length of the room. An average of 80 colors in 11 different yarn numbers are stored. In this photograph, Clarence Burnham, assistant overseer, selects selvage yarn to be creeled at the warper. But special creels at the slasher are used on other warps.

ONE BRAND-NEW BUILDING. New material-handling equipment. Better production equipment. And more modern methods. That's a quick summary of the up-dated warp-yarn preparation room at Swift Mfg. Co., Columbus, Ga.

In terms of organization, Swift has now coordinated all machines under one department head in its new, more spacious building. And as Swift moves into its new room, it is producing 240,000 lb. of yarn per week—an over-all increase of 33% over the output of the old, scattered departments.

Yarns run the gamut from 1½s to 20s cotton, 2½s to 30s spun rayon, 60- to 200-den. filament nylon, and 2½s to 3s blends of spun rayon, nylon, and cotton. Yarns include nubs, slubs, and all types of fancy novelties.

Today, there are 11 different yarn numbers, 27 different kinds of yarn, and 67 colors. These yarns go into light lenos with only 500 warp ends—and into drapery fabrics with up to 5,000 ends. Other woven fabrics you'll find at Swift are auto and furniture upholstery, denim, and many specialties.

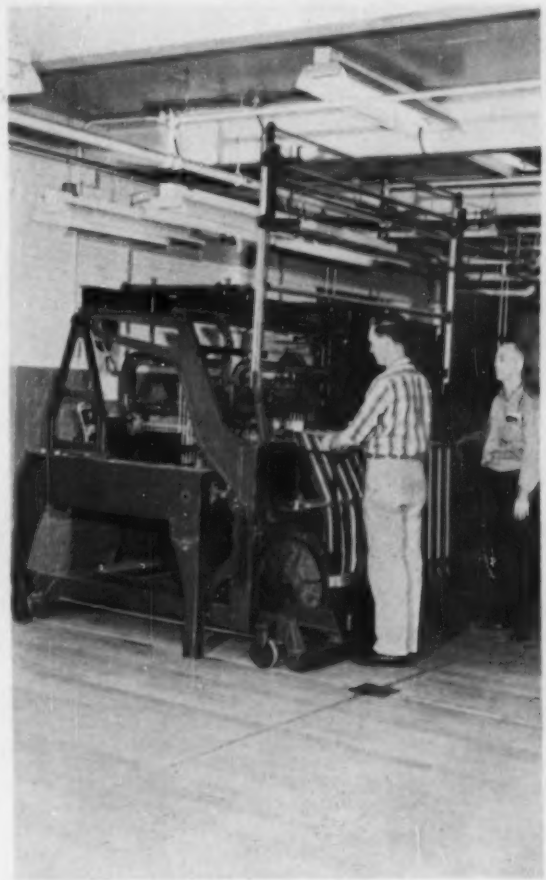
WEAVING 750 FABRICS

Swift has nine different types of looms, including C&K W-3, C-4, C-5, and Draper XP, XL, and X-2. Right now one group of 90 84-in. W-3 looms is weaving 55 different styles. And on 120 60-in. Draper dobby-equipped looms, there are 74 different patterns. About 300 different styles, each in as many as three patterns—for a total of 750 patterns—are being woven on the 1,000 looms at Swift.

Short-run yarns and fancy yarns are run on cone winders from spinning packages. Packages from 2½-in.-gage spinning rings weigh 8 oz. Bobbins from 3-in. rings weigh 10½ oz. All bobbin traverse is 9 ins.

One 50-unit Foster winder is used exclusively for yarns to be package dyed. Packages weigh 1 lb. Winder speed is 330 yd. per min. Three Universal No.

NEW DRAWING-IN MACHINE draws 136 ends per minute on 2 to 22 harnesses. This pattern is on 10 harnesses and is 805 bars long for harnesses. Drop wires and the reed are drawn from an additional short chain because they are standard draws. Overseer C. M. Henderson (right) is checking machine operation.



44 Roto Coners with 120 spindles each wind fancy and novelty yarns to 4-lb. packages at 300 to 750 yd. per min.

Regular yarns are run on two Barber-Colman Four-Count spoolers, each with 306 spindles. The No. 1 spooler runs 1,200 rpm. No. 2 runs 1,000 rpm.

TRUCKS REPLACE TROUGHS

An important change in bobbin handling at spoolers has just been completed. Today you won't find any bobbin troughs. Spring-loaded trucks shaped to fit into the trough space have replaced them. Bobbins are doffed into these trucks at spinning frames, and thus are rolled to the spoolers. Spooler tenders remove the bobbins directly from the trucks and place them in the spooler pockets.

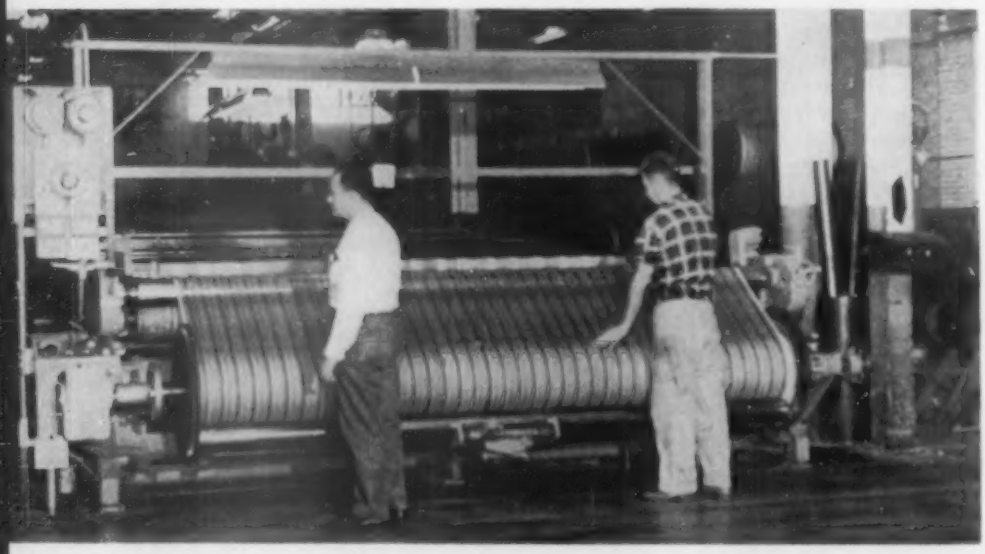
There are three Reiner warpers. The first two warpers—average speed is 350 yd. per min.—are used for novelty yarns. Each creel has 520 ends. Package holders hold cones, cheeses, or spinning bobbins.

WARPERS FOR SPECIAL YARNS

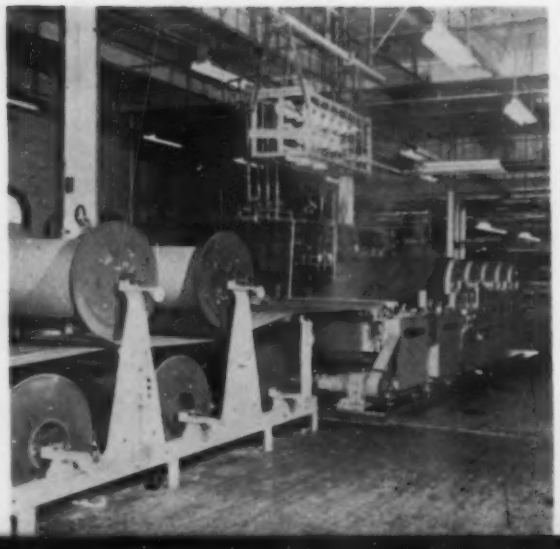
The third Reiner warper is in a room by itself. It's used for beaming continuous-filament nylon and other special man-made fibers or blends of fibers. It also runs at 350 yd. per min. This warper has a static eliminator, special drop wires, and special tension weights.

There are four Barber-Colman warpers. Two are Type CC combination ball-and-beam warpers that use either wood section beams, dye beams, or balls. The other two run either wood section beams or dye beams. Warper speed is 650 yd. per min. on wood section beams and 450 yd. per min. on dye beams and balls. All warpers have VC creels for continuous creeling. Section beams average 10,000 yd. in length. All warpers are doffed pneumatically.

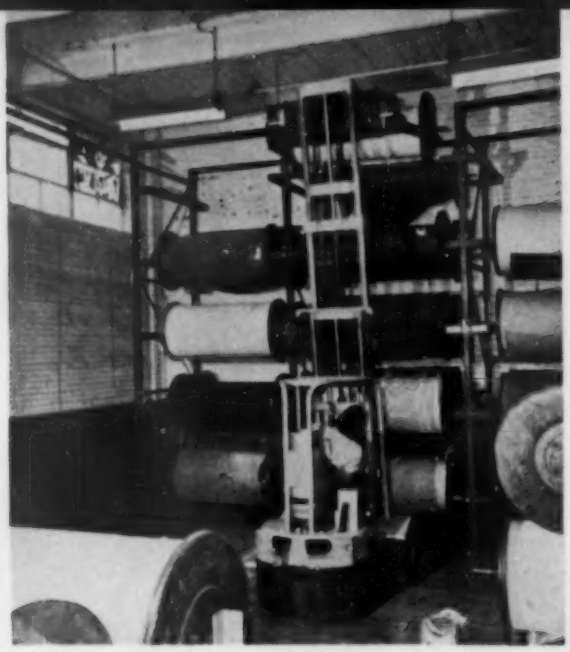
All of this yarn-preparation equipment is in a reconditioned section of the old mill. Swift has laid a new maple floor, repositioned columns for best machine layout, and repainted the building.



NEWEST SLASHER is 120 in. wide. This yarn-dyed warp has five colors in 2,740 ends of 6s yarn. Foreman Douglas Holt (left) is checking the speed and yarn-stretch indicator. This slasher also slashes warps only 45 in. wide by setting the traversing headstock and tailstock with the handwheel at the right.



REAR VIEW of the 120-in. slasher shows the double size boxes, each with a stainless-steel immersion roll and synthetic-rubber-covered top roll. Temperature of the size in the size box is held at 202° F. on all types of warps. This slasher, as are all new slashers at Swift, was made by Cocker.



NEW STORAGE RACKS in the slasher room store full yarn beams up to five tiers high. The fork-truck operator can remove or replace a beam in 2 min. There are 11 different types of beams, each in several widths, and therefore the rack sections are also in several varying widths.

SLASHER ROOM—A NEW BUILDING

The slasher room is in a new building designed and built to house the new slasher. There are eight new Cocker slashers and one two-head slasher, which was held from the old slashers.

The last slasher installed is a 120-in. model used most of the time to slash fancy fabrics that are woven on 120-in. XL looms. An average warp of this type has 2,740 ends of 6s yarn in five to seven colors of stripes. There are about 1,880 yd. per loom beam. This material is woven up to 122.61 in. wide in the reed. Slasher speed at this width is 40 yd. per min.

But since this last slasher has a traversing headstock and tailstock, it also runs warps as narrow as 45 in. between beam heads. It has a Westinghouse magnetic-amplifier drive, thus speed and stretch indicators and a pneumatic presser roll. A simple hard-operated flip-switch recently installed by the mill's electrical department controls the stretch on changes from light sets to heavy sets (and *vice versa*.)

WIDE SLASHER, MANY FEATURES

The 120-in. slasher, like three other slashers, has double size boxes with two steel immersion rolls and two synthetic-rubber-covered top rolls and nine stainless-steel 30-in.-dia. cylinders. The first three cylinders are coated with Teflon. Cylinder temperature is controlled in groups of three cylinders, with steam pressure usually 30 psi. The slashers also have automatic level controls at the size box. All have traversing headstocks and tailstocks and pneumatic presser rolls.

Because dye beams with up to eight different colors are run together on these slashers, the slashers have five predryers. They have 18-beam-capacity creels. Squeeze-roll pressure on the 120-in. slasher is 400 psi. with pneumatic loading. There's an additional 500 lb. of dead weight of the roll for a total of 900 lb.

Speed on slashers 45, 72, and 84 in. wide is 60 yd. per min. on average sets. Moisture content of slashed warps is held at 6 to 7%, with 7% preferred. Stretch is kept below 2%.

Electric hoists on monorails are used to doff all full loom yarn beams at the slashers and to put in empty beams. At present, 11 different types of loom beams, each in several widths, are being used. A new rack storage system around the back wall and one end of the slasher room stores slashed loom yarn beams all the way from the floor to the ceiling in five tiers.

STANDARDIZED SIZE MAKING

Size is cooked with strict control by a Norcross Sizeometer. Yarn-Preparation overseer C. M. Henderson checks the recorder throughout the day and checks the chart thoroughly through the second and third shifts at the beginning of each day. Therefore he knows how many size mixes are made on each shift and how accurate the viscosity is of each mix.

Viscosity of the Sizeometer is checked against the cup method for constant accuracy. For example, denim at 30% viscosity is 12 sec. by the cup. A heavy warp set is 80% viscosity and 18 sec. by the cup.

With strict, constant control at size cooking, Swift is able to use any one of three manufacturers' starch and five manufacturers' sizing compound interchangeably in only three size formulas for all cotton warps.

FAST, ACCURATE COOKING

Swift uses modified pearl starch exclusively. In place of a liquid enzyme, table-form enzyme is used for greater accuracy and convenience. One table is used for denim warp formulas, two tablets for heavy formulas.

Size-making equipment consists of one cooking kettle equipped with the Viscometer, four 300-gal. storage kettles (each with a 2-hp. centrifugal pump), and a water-metering unit. Size lines from the storage kettles to the size boxes are stainless steel, as are all valves. Size lines are painted with different identifying colors at the storage kettle and the size box so that slasher operators can be sure they're using the correct size formula for their warps.

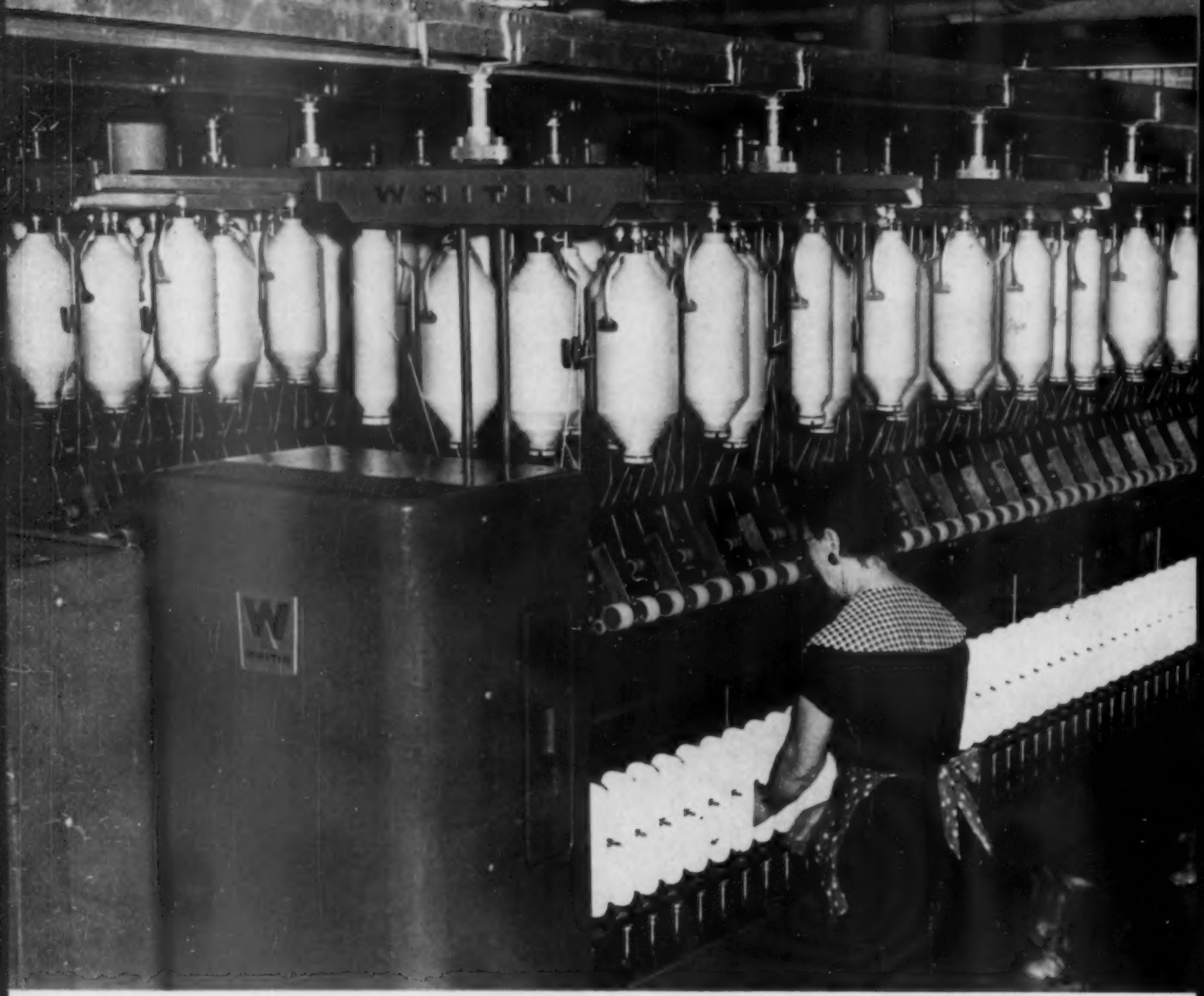
Size formulas are cooked fast and accurately. Average cooking time for a batch is a little less than 29 min. Often 36 mixtures are made within a 24-hr. day.

The formula is cooked at 204° F. at 30-rpm. agitation. Size is held at 202° F. in storage with 22-rpm. agitation. Size in the size box is also kept at 202° F.

Swift has taken most of the manual labor out of size making. It buys all starch in 100-lb. bags. It buys sizing compound in drums or in 5-lb., individually wrapped, polyethylene packages so that it doesn't have to be weighed.

The drums of compound are lifted to the overhead size-making platform by hoist. Pallets of bagged starch are lifted to the platform by fork trucks.

All of Swift's size formulas call for an even 100 lb. or 200 lb., so there's no weighing or measuring of starch.



UP-TO-DATE SPINNING FRAMES represent the biggest single expenditure. Company has bought 140 machines.

A $3.5-Million Vote for

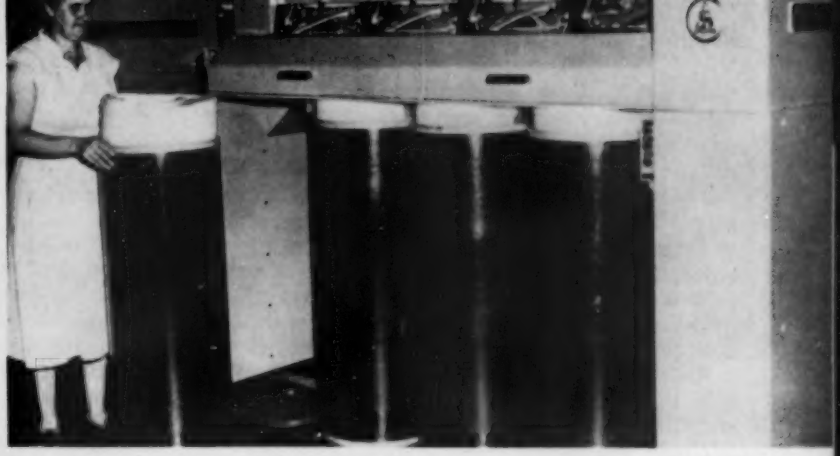
That's how much American Thread Co. has just spent to modernize and consolidate its operations.

Payoff: (1) Keep competitive; (2) Improve product quality.

"DURING THE NEXT DECADE, the strong, high-quality, low-cost mills will prosper and the marginal mills will fall by the wayside."

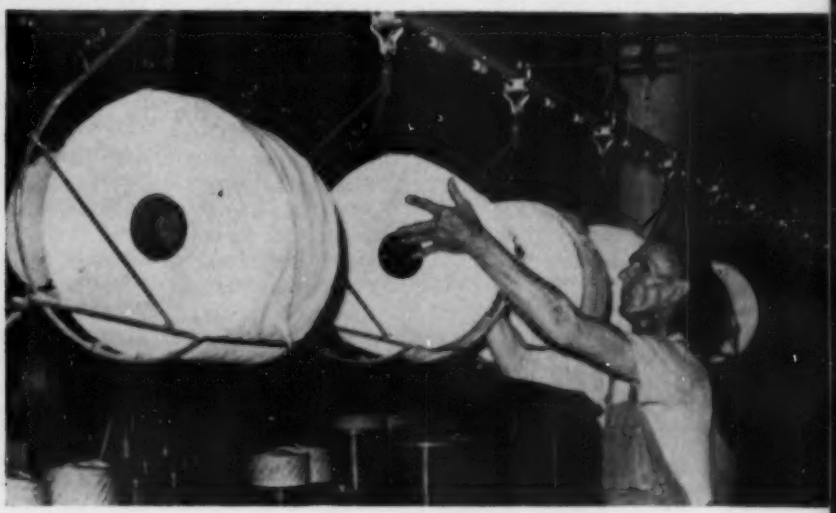
That is how American Thread Co.'s President, E. B. Shaw, sees the immediate future. And that is the kind of reasoning that triggered his decision to invest $3.5-million in spinning plants and new equipment.

The program is now nearing completion. It has brought to two Georgia mills a full range of new spinning, roving, drawing, and combing equipment—plus work-saving devices and additional floor space. The company has also made manufacturing improvements at its Willimantic, Conn., and Clover, S. C., mills.



HIGH-SPEED VERSA-MATIC DRAWING at Dalton and Tallapoosa has increased production and improved fiber control.

COMBER LAPS at Dalton are transported on a conveyor that runs from the lap winders to Model 57 combers.



the Future

Net result is that the company can now produce virtually the same volume of yarn in four spinning mills that it produced in six mills a year ago. And quality is much better.

OBJECTIVE: BETTER VALUE

The reasoning behind all this effort is explained this way by Sales Vice-President C. E. Bowne: "We are determined to give the company that elects to

. . . *Turn the page*

TWO-STORY ADDITION at Tallapoosa has 16,500 sq. ft. of floor space; it houses twisters, doublers, and spoolers.

Begins on page 52

spend a dollar at American Thread the best possible value in price, quality, and service in the thread and yarn field.

"The underlying conditions leading to this declaration of policy," Mr. Bowne adds, "include: (1) shrinking per-capita consumption caused by the development of longer-wearing garments and changes in apparel styles; (2) intensified competition among domestic producers; and (3) growing foreign competition."

Management at American Thread believes that the flourishing United States population (estimated to rise another 25% during the next 20 years) will offset these adverse conditions in part. It's this growth that Mr. Shaw has his eye on when he predicts "strong . . . mills will prosper."

To achieve greater efficiency and quality in its spinning operations, American Thread first focused its sights on the Tallapoosa and Dalton, Ga., mills. By installing equipment that will handle larger packages, and process them better and faster, the company is making these mills fully competitve with the most advanced plants in the industry.

Both mills, in the 40- to 60,000-spindle class, produce combed threads in high volume in a full range of sizes.

The mill at Tallapoosa is now almost completely re-equipped from the breaker drawing frames forward. Old breaker and finisher drawing has been pulled out, and new Saco-Lowell Versa-Matic frames with twice the speed of the old frames replace them.

Twenty-one new Saco-Lowell Model 57 machines, all equipped to handle 16x42 sliver cans, now take the place of 25 Tunstall combers. In the roving department, new 13½ x 7 Saco-Lowell machines are taking the place of most of the 10x5 frames.

A 25% BOOST FOR SPINNING

In the spinning department, a total of 60 new Whitin Piedmont frames are now being installed. Roughly the same number of existing H&B frames are being equipped with an improved drafting change-over and antifriction spindles. Payoff: About a 25% increase in poundage production.

Other improvements include a new Parks-Cramer air-changing system for the spinning area plus frame cleaners and waste-collecting devices.

In addition to this equipment, the mill will receive other machinery from the company's Newnan (Ga.) mill, which will discontinue operations later this year. Included here will be a picker for ATCO's Dacron-cotton blend, 20 cards, and several 160-spindle 8 x 4 roving frames.

As expected, the installation of this machinery called for a complete internal reshuffle of equipment, which was accomplished without the loss of any scheduled production hours. Some additional space was needed, so a company-engineered, two-story addition was constructed.

In addition to the new processing equipment installed at Dalton, two new American MonoRail conveyors were added.

The larger of the two conveyors, a 1,400-ft. chainless monorail, hauls 99-yd. picker laps into the card room and serves as a mobile stock room for card tenders to use as required. The other conveyor, 700 ft. in length, bears comber laps from the lappers through the combing section.

HIGH-SPEED DRAWING AND ROVING

As to new processing equipment, Dalton has replaced all of its drawing with new Saco-Lowell Versa-Matic machines. Lappers and combers have been changed over to the larger 16 x 42 cans. Half of the roving has been replaced with 13½ x 7 Saco-Lowell frames, and plans are under study to do the same with the other half.

Rounding out the Dalton program are 80 new Piedmont spinning frames. And there is a good possibility that the mill's remaining frames will be changed over to a high-draft system.

A partial spinning change-over is also scheduled for the company's Willimantic mill. Meanwhile, the Clover mill will receive newer roving as a result of the changes at other mills.

An important phase of the modernization is its effect on employees. While it isn't automation in the strictest pushbutton sense, the program is automation-like in that it is causing displacement of personnel. Accepting this as a problem from the beginning, the company has worked conscientiously to minimize the impact of changed conditions.

Management first explained to all employees, especially those who would be directly affected, what the company was planning to do and—more important—why the program was underway. For unaffected employees, the program was identified as another part of a continuing campaign to "Keep American Thread Ahead," a campaign that is making their jobs more secure than ever before. Frequent follow-up progress reports have kept affected employees posted on developments.

Meanwhile the company made a concerted effort to sell its Newnan mill as a going concern. Only after this possibility had been thoroughly explored did the management conclude that this mill would have to be closed down. The smaller Troutman (N. C.) mill, not as marketable as Newnan, was sold to a local firm.

What has American Thread's multimillion dollar investment accomplished? It is probably too early to assess its full value, according to the management, but all hands are confident that the program will result in a substantial reduction in operating costs as well as a marked improvement in quality. The initial run-ins of the new equipment have definitely served to bear out this estimate.

President Shaw believes the company is in its best competitive position in recent years because it is moving fast toward its aims: low cost, high quality. The net worth of the effort in terms of sales and profit figures, of course, will be established in the months and years to come.

[American Thread recently started up one of the largest and most up-to-date electronic-computer systems in the textile industry. Details and cost of the operation were described in TEXTILE WORLD, March 1960, p. 56—Editor.]

Electrical breakdowns can hit your mill hard—and hurt badly. That's why you need to build up your guard and keep it strong. Here's how, in five steps. It's . . .

Electrical Maintenance With a Payoff

SETTING UP A MAINTENANCE PROGRAM for the electrical equipment in your mill? Want to be sure you've got every base covered? Want a guarantee that the program you're creating will really work?

Then take a leaf from the book of the people whose business it is to know these things. These people (General Electric Co.) say it takes five steps, in the following order, to get an honest-to-goodness electrical maintenance program.

Here are the five steps:

1. GET ALL THE DATA

Conduct a survey of all the electrical equipment in your plant. You have to know what you have and where it is. Your equipment inventory is the very starting point and basis of a workable maintenance record system.

To identify each unit properly, assign an inventory number. The number will indicate building, floor, and machine. You'll want to put this number on the equipment or machine in a prominent place.

Simplify your inventory by using record sheets or cards listing general data desired. Let your area mechanics fill in these sheets. The record sheet should include a description of the equipment and its application; its rating and serial number; the name of the manufacturer and his sales agent; and its cost.

2. DECIDE ON MAINTENANCE

Decide how much care is warranted by the importance of the equipment. Your objective is to determine not the greatest maintenance, but the best maintenance. You should include only the equipment where preventive maintenance will pay its own way or help make workers safe. Anyone can do a complete maintenance job. But sometimes a complete job is unnecessary—and unnecessarily expensive.

In some instances you'll find it cheaper (and harmless, too) to replace or repair a part after it wears out rather than before. It may not be worth the cost and trouble to include noncritical equipment in your preventive maintenance plan.

3. SET UP YOUR CONTROLS

Set up an inspection cycle that strikes a balance between "too often" (with a resultant waste of money) and "not often enough" (with possible damaging outages).

The repair record will tell you if you should give equipment more attention. On the other hand, ask your inspectors to note on their report forms if the frequency can be cut down.

Inspectors should work on schedule and should check according to a set of instruction. They should also keep written records and make daily inspection reports in writing to the maintenance foreman. This daily report is analyzed to determine material and labor requirements and estimated time for completion of each job. Usually inspectors inspect only one type of equipment at a time.

4. DECIDE WHAT'S CRITICAL

Identify the equipment that has vital operating importance. Then determine its condition and the price you pay when it fails. Prepare a list of critical equipment.

Close cooperation between production and maintenance departments is necessary. Together these two groups must evaluate the functional importance and duty cycles of all electrical equipment in the plant.

Equipment is considered vital if its failure directly or indirectly interrupts or delays production. The answer you arrive at will basically depend on your production operation, and this answer will assure you of continuous production.

5. PLAN WELL AHEAD

Minimize downtime cost in two ways:

- Stock critical renewal parts.
- Schedule overhauls well ahead.

Decide which parts are most important and get them first. Then organize your budget so that you can buy the rest of your critical stock on a planned basis.

Plan overhauls well ahead so that all the men, tools, and materials you need are available at the proper time. You can schedule overhauls for normal machine downtime or for vacation shutdown. The objective: Disturb production the least amount possible.

Planned overhaul is effective after equipment has operated a reason able service life. On a systematic basis you should remove the equipment that needs overhauling most (or is most important to operation).

Textile World

POINTERS FOR SUPERVISORS

You and the Man You Boss

Once you move up to a position of authority over men with whom you used to work, things aren't the same—can't be and never will be. Here's advice on how to use your new-found power—for your own good and the good of the men you supervise.

By S. G. WILLIAMS, Management Consultant, New York City

"WHY TELL ME about it, Phil? Why don't you just put the new spindle on, and do what you have to do to catch up in that department?"

Imagine that you've overheard that bit of dialogue. Sounds like good managerial logic, doesn't it? Sounds like a superintendent giving real responsibility to one of his foremen—telling him to run his operation without coming to the boss with every little problem. But take a deeper look. What do you see? If you're skillful at reading between the lines, perhaps one of these four possibilities will suggest itself:

1. It's a switch on Phil—Perhaps Phil has had to come upstairs even for minor decisions. Could be that his boss has held such tight rein on him that he's unaccustomed to thinking for himself.

2. Phil doesn't know what to do—There's a good chance that Phil's job responsibilities have never been described or explained to him.

3. Phil's boss is muddled—He doesn't know just what a manager's job is—doesn't understand basic managerial skills like delegating authority and responsibility—doesn't comprehend that the job of any manager is to train people to do their job, plus a little more.

4. Phil's boss isn't consistent—Sometimes, perhaps, the boss wants Phil to "clear everything with me," At other times (like the one described above), his boss doesn't want Phil to bother him with the same old questions.

The job of managing people is complex and often harassing. But it's the most important task you have. That's why consistency and self-confidence are two indispensable qualities—are the things that often make the difference between success and failure as a boss.

THE PRICE OF POWER

A fact you cannot escape is that a power relationship exists between you and the men you boss. And that condition prevails no matter who your subordinate is. Maybe he has been your closest friend. (Perhaps he still is.) No matter who he is or was, you—as the boss—are closer to top management than he is. You get information that he does not get. You can help or hinder his career, his income, his promotions, demotions, transfers, or discharge. You evaluate his work, control his access to higher management. In a word, you hold power over him.

Power has inevitable and predictable results. And the day you were promoted out of your old group, no doubt you felt the first of the inevitable results. Perhaps you experienced a situation similar to that of Joe S., assistant superintendent of a large mill:

"All the fellows were genial. We were a team on the job and off. We used to go bowling together, fish, and hunt. But now—I can't figure out what's happened.

"They're still nice enough. They'll say, 'Hi, Joe,' in the morning—things like that . . ."

"But things have changed. The old warmth is gone," Joe says. "I don't hear nearly as much about what's going on as I used to. I ask one of the boys to go fishing and he tells me he has to drive his wife up to Charlotte. I'm the same man I was before I got moved up. I don't feel any different toward them. Why should they act so different toward me?"

The answer to Joe's question is plain: You can't get away from the effects of power. Joe is paying part of the price of having power. But Joe can use his new-found power to good advantage. He can control the way in which he pays the price. The method of payment doesn't need to be painful. Matter of fact, it can be downright pleasurable.

YOUR PRIMARY FUNCTION

You probably supervise several people. Narrow the focus a bit to

just one of your subordinates and call him "the man you boss." What is it you're supposed to be doing as far as he's concerned? See that he gets his work done? Perhaps. One popular definition of management is "getting the work done through other people."

But that isn't all. That definition is only part of the picture. Just getting the work done is not enough, not by any means. You wouldn't be satisfied with that yardstick, and your superiors would certainly cock a quizzical eye if next week, next month, next year the man who reports to you does everything just the same—with the same costs, same bottlenecks, same scrap, safety record, attendance losses, turnover, production efficiency, and morale.

Your prime function, then, is getting the work done better, with regular—if not continuous—improvements in all the elements listed above. Happily, by combining this, your essential responsibility, with the power problem, you can come closest to doing the best possible job for yourself and for the man you boss.

PUTTING POWER TO WORK—

What can you as a supervisor do to benefit your subordinates and to improve the quality of their work? What can you do to make these men happy that you moved up? You can do four things:

1. Communicate—In your higher position, you attend more meetings, have greater knowledge of policy, get in on policy-setting sessions. Therefore you have opportunities to learn more about everything. Tell your subordinates these things. Don't hold on to the information as though it were too valuable to let loose. Don't make the mistake of regarding such inside information as a special prerogative of your rank.

Of course you aren't expected to tell all. Some data should be kept under cover (such as provisional plans that are not yet solidified). But most information you get doesn't need to be kept secret at all. If you are keeping such information to yourself, perhaps you'd better size up your own motives. Could it be that you're hoarding such information to bolster your own ego? Could you be trying to enhance your own status feelings by being tight-lipped? That's one possibility, and it won't pay to ignore it.

But, on the other hand, imagine the good effects on your subordinates of an open-mouth policy (within reasonable limits):

"We sure know lots more about what's going on since Joe took over his new job. It's mighty satisfying—and helpful, too—to have a boss who lets you in on things . . ."

2. Develop—The most direct and practical way to make the operations go better is by helping the man you boss to grow in his job. The more skilled he becomes, the better performance you can expect. Use your powers to expand his horizons, to boost his job skills. The means for development are limitless. All it takes is imagination and boldness. Therefore, make it a point to:

. . . Delegate more special projects to him.

. . . Arrange for him to visit other mills and other departments.

. . . Send him to a conference, to a convention. Nothing stretches a man's imagination and thinking like a chance to attend a meeting of like-minded people.

. . . Hold meetings of your own. But don't make the mistake of thinking you're doing your part in developing your subordinate's job capabilities simply by staging the run-of-mill operations, scheduling, or cost meetings. The kind of meeting that helps a man grow is the problem-solving, planning, cost-reduction type of meetings.

These suggestions, of course, are only a scattering of the possible steps you can take to boost the potential of your subordinates.

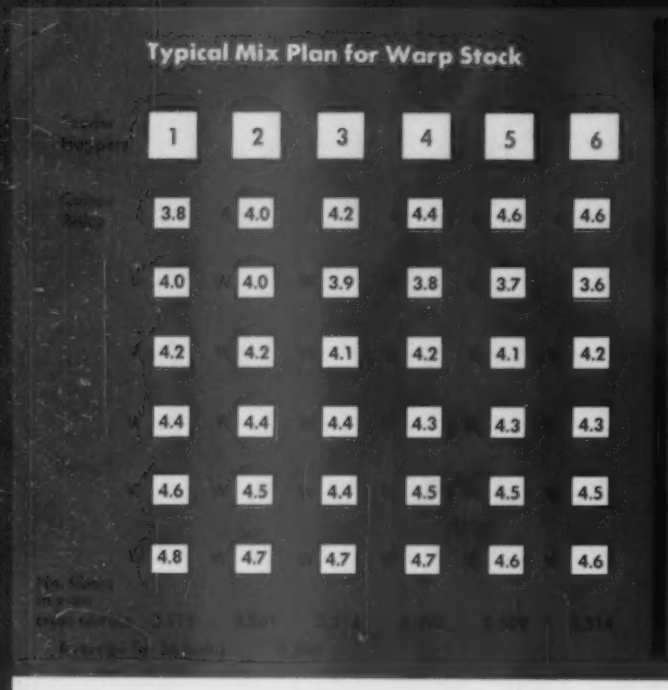
Most subordinates are hungry for such advantages. But they depend on you. You have the ability and the power to set up such opportunities. Make the best use of your powers and you'll go a long way toward convincing your subordinates that you are interested in their future. Results: high morale, loyalty.

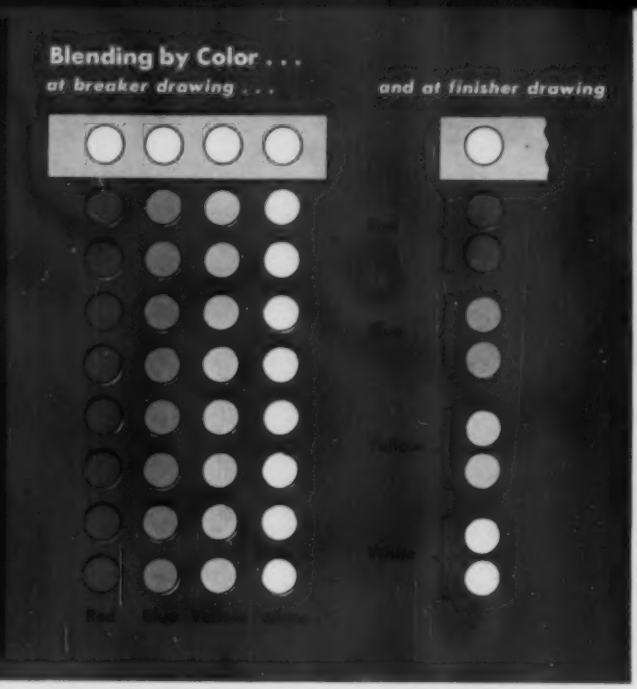
3. Promote—There are management experts who say the outstanding mark of a successful manager is his ability to get people under him advanced out of his jurisdiction to better jobs. It's the mark of a savvy manager if his subordinates move up. It's the most significant sign that the manager is developing people, giving them responsibility, keeping them informed, motivating and inspiring them. It shows a man who is not afraid to undertake the training of new subordinates. It shows a man who is not dependent on the people working for him for his own feelings of security.

But you'll have to work at the job of training men for better things. You have to be constantly preparing your people for better assignments, and stay alert for better job opportunities that are going to be available. You have to talk up your team, and be able to back up your talk with evidences of success—success in which you have played a part because you were conscientious about both your own job and the job of the man you boss. Difficult? Not at all, if you are honestly interested in your subordinates.

4. Remember—The final use of power is really a way to avoid the abuse of power. Every once in a while sit back in your chair, recall the days when you were in the position now held by your subordinate. What did you think of the boss?

Then bring your remembering up to date. Remember that just as you and your boss make up a management unit, so you and the man you boss are also a management unit—a team assigned to do a part of the total job.





Adding new mix plan . . . to a new color code . . .

. . . Better Blending for

THEY'VE BOOSTED the quality of print cloth and have saved up to 25% on direct labor costs at Newberry Mills, Inc. (Newberry, S. C.). How? By updating opening-room equipment and installing a slick new system of cotton-blending at each process through drawing. The new system does these things for Newberry Mills:

- Improves drawing variation as much as 4.5%.
- Makes roving variation nearly 6% better.
- Cuts warp yarn imperfections 42.8% (with 24% better variation and a break factor that is 7.44% higher than before).
- Upgrades filling yarn in the degree you would expect from the improvements above.

Newberry's machine changes now make it possible to do a higher-quality job with substantially fewer people employed in opening and picking operations, too. For instance, the total number of operators in opening and picking has dropped from 12 to 9 (that's a 25% direct labor saving), while picker operation manhours have been slashed in about the same degree—from 120 to 92 per week (a 23.3% saving).

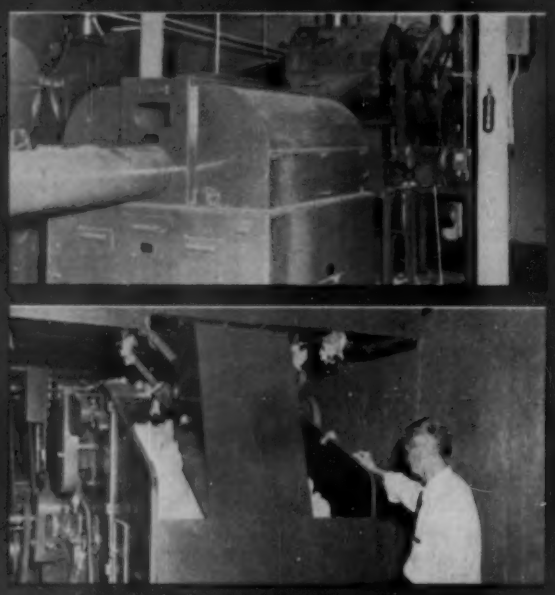
Key to improved blending operations is Micronaire value weighting against the number of fibers in the cross section of yarn. Newberry processes cotton of $1\frac{1}{16}$-in. M and SLlf grades with Micronaire values ranging from 3.5 to 4.8. Average value per shipment must be between 4.0 and 4.3. (Samples are taken from two sides of each bale and are carefully tested for fineness.)

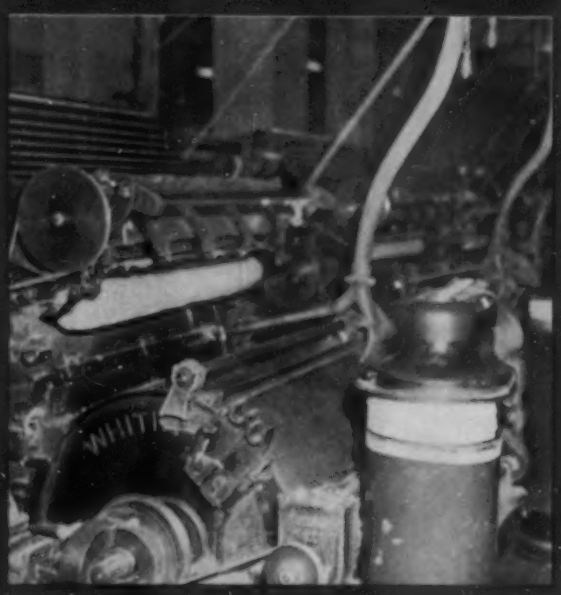
IMPROVEMENT 1: Charting the Mix

Blending operation begins in the cotton department, where a mix plan is charted according to formula above. Thirty-six bales in lines of six behind each six feeder hoppers for warp yarn go into place. (Procedure and number of hoppers are the same for filling yarn.)

The mix plan indicates exactly where each bale will be laid down according to Micronaire number. It also shows the approximate number of fibers that should appear in a cross section of yarn made from each six bales. By the time all 36 bales are blended, the number of fibers in the cross section levels out to the desired average—slightly over 3,500 in the example shown.

To make a warp mix, for example, hoppers are calibrated so that pounds fed per hour from each bale are within close tolerances. Otherwise, a 4.0 mix on the opening-room floor might easily turn into a 4.5 mix by the time the stock is spun. One safeguard against this possibility is regular testing of laps, drawing sliver, and Pneumafil waste for Micronaire valves.





plus opener, feeder, and . . . special cans, adds up to

Top Quality in Print-Cloth Yarn

IMPROVEMENT 2: Laying Down, Feeding

The opening room has a total of 12 blending feeders, each of which processes about 175 lb. of cotton per hour with two operators. One handles and lays down the cotton, the other feeds it into the machine.

After the cotton is opened it passes through a pneumatic pipe equipped with magnets to two lines of cleaning equipment located in the picker room.

The new warp line consists basically of a feeder, Axi-Flo, separator, and a Superior cleaner. In the filling line are a feeder, an apron and beater section, a Superjet cleaner, a second beater section, a second Superjet, and a Superior cleaner. One man runs both lines.

In another section of the room are six single-process pickers that make 61-lb. laps. These machines have multiblade front beaters and two-blade beaters in the rear. Beaters run from 1,000 to 1,100 rpm., and fans run 1,500 rpm. Laps get manual handling.

IMPROVEMENT 3: Identifying Feed Cans

While relatively few mechanical changes have been made in the carding and drawing departments, Newberry carefully controls the method of doffing cards and feeding drawing frames so that the stock receives much more than normal blending. Heart of the blending system at these processes is a color system used to identify specific cans of sliver.

For control purposes, cards are divided into groups of 12 and given a color designation—red, blue, yellow, and white. Each group feeds into cans that have bands corresponding to the group color. Within groups, stripping and doffing schedules are staggered to improve blending and cleaning.

At drawing, eight card cans of a single color are placed behind each delivery of the eight-ends-up breaker drawing. There are four different colors for each frame, which means that the stock comes from four different areas of the card room.

The feeding arrangement is different at the finisher frames. Instead of creeling eight cans of a single color behind each delivery, as in breaker drawing, Newberry feeds each delivery from four different colors. These frames also are eight ends up; so two cans of each color are required behind each delivery.

This close control at all processes —especially drawing—assures each strand of finisher sliver an almost equal number of fibers from each of the 36 bales of cotton. And Micronaire tests prove it.

Progress in Spinning and

Today it's a question for lively debate. At their recent meeting the Textile Operating Executives of Georgia turned carding and spinning upside down, looked at them from every angle. Here's how they see these operations today—full of problems, but moving ahead.

RUN THROUGH THE WHOLE GAMUT of carding and spinning problems and methods today. Chances are you won't find one anywhere that didn't come under debate at the most recent meeting (April 23) of the Textile Operating Executives of Georgia.

The men who came to this meeting (in Atlanta) are supervisors in mills with over 1,076,000 spindles. That's a lot of room for conflicting views and sound evaluations. The positions they take and the views they state may throw light on some of your problems—may guide you to changes in your own methods and in your plans for new equipment and modernization.

HOW THE EXPERTS SEE 9 SPINNING PROBLEMS

1. CLEARER COVERS

Some mills like synthetic covers for revolving top clearers on spinning. Others don't.

"Yes" reports—"We've got fifteen 2¾ in.-gage filling frames equipped with synthetic flipper-type clearers running in the same direction the length of the roll. We run mostly 19s combed yarn. At slow speeds fly built up and flippers broke because of excessive loading. At high speeds build-up transfers from drafting zone to clearer. We don't have to pick rolls any oftener than with conventional clearers. Yarn looks the same."

That's the way one mill sees it. Here's another:

"We liked results so much that we put synthetic covers in all our rooms. They clean easier. No bad effects in waste or fly build-up for numbers ranging from 6s to 27s."

Middle-of-the-road report—"We've had a little experience with sponge-type clearer covers on 2s to 12s yarn. No excessive fly or build-up in the drafting, no change in yarn looks or roll-picking schedule."

"No" report—"We put corrugated synthetic covers on frames spinning 6s to 27s. They looked good. But instead of picking up excess lint, they left it on the rolls so it went into the yarn."

2. TOP ROLLS

Intervals for buffing and for greasing antifriction top rolls range from 4 months to 3 years. Cot-replacement methods differ widely. Usual interval between replacing cots and buffing them is 24 hours.

Replacing cots—Mills report several methods: (1) Shell is cleaned when cots are replaced. Cots come with cement already applied inside. (2) Shell is cleaned with thinner and rotary wire brush. Roll is dipped in water before cot is applied. (3) Shell is cleaned with steel-wire brush and solvent. Glue is applied to shell before cot is applied. Four-day wait before buffing.

3. RELATIVE HUMIDITY

You can reduce spinning-room humidity when you install vacuum end-collection systems. With temperature at 80 to 85° F., mills report with vacuum end collectors (and with temperature from 80 to 85° F.) humidity has dropped in one instance from 55 to 45%; in another instance from 62 to 50%; and in another from 55 to 39%. In general, they point out that higher humidity increases roll laps.

Exception—One supervisor reports his mill can run at 72% r.h. without getting into trouble with roll laps.

4. FILLING SPINNING

Package size and type of cam used range all over the lot.

Take these samples:

- Spinning 48.5s yarn with 3.11 TM on 9-in. bobbin 1 15/16 in. in diameter; taper, $2\frac{7}{16}$ in.; weight, 0.27 lb.; cam, 3 lobes with 1¼-in. follower.
- Spinning 9.75s to 15.50s with 4.35 TM on 8¾-in. quill 1⅝ in. in diameter; taper, 2 in.; weight, 0.1033 lb.; cam, 8-point with 1¼-in. follower.
- Spinning 41s with TM 4.25 on 8-in. quill 1 15/16 in. in diameter; taper, 1¾ in.; weight, 0.084 lb.; cam, 4-point with 1⅜-in. Pitman roll.
- Spinning 6s to 20s with TM 3.40 to 4.00 on 8¾-in. quill 1¼ to 1⅜ in. in diameter; taper, 1¾ and 2 in.; weight, 0.104 and 0.139 lb.; cam, 3-point non-sloughing with 1-in. follower.
- Spinning 14s to 45s with TM 3.52 to 4.43 on 8- to 8¾-in. quill 1¼ to 1 11/32 in. in diameter; taper, 1½ to 1⅞ in.; weight, 1¼ to 2 oz.; cam, 4-point with 1⅛ ball-bearing Pitman roll.

Carding: Fact or Fancy?

5. PAPER TUBES

They stick on spindles—but mostly because of rough handling.

Take your pick of solutions:

- Polish the contact area with crocus cloth.
- Reshape the ferrule with a special tool, add a cushion to the table.
- Rub wax on top of the spindle.
- Be sure you've got the right size.
- Don't let doffers jam tubes.
- Train workers in bobbin handling.

6. SOFT COTS

Soft cots improve breaking strength and ends down. There's no standard interval for buffing them.

Buffing intervals range from once a year (vs. 3 months for regular cots) to every 4 months (vs. 6 months for regular cots). Mills report up to 10% fewer ends down and increases of up to 100 points in breaking strength. One mill uses soft cots only on the back line. Another prefers medium-hard cots.

7. NEW DRAFTING SYSTEMS

Results are uniformly good—higher yarn strength, fewer ends down, heavier work assignments, less cleaning.

Here are nutshell views:

- Tru-Set — Higher drafts, 25% fewer ends down, less scrubbing, overhauling, cleaning, oiling.
- Unitrol—Yarn uniformity up from 16.4 to 15.3% CV. Ends down cut from 41.82 to 28.44 per 1,000 spindle hours. Break factor up.
- Cole—Yarn strength up 15%, ends down better by 10%.
- Duo-Roth—Ends down cut 40% with front-roll speed 10% higher. Yarn uniformity improved.

8. TRAVELERS

Special-finish travelers cost more but last longer. Service is satisfactory. Changes cost less.

Two cases, as follows:

- Traveler speed is 5,700 fpm. for warp yarn being spun at 10,900 rpm. Spindle speed (up from 10,400 rpm.). No excessive ring wear.
- Traveler speed is 5,400 fpm. At first, special-finish travelers came off easily, requiring a smaller circle; ends down were hard to get up after doffing; doffer was slowed down. But 125 special-finish travelers are now in use. No noticeable ring wear.

9. BOBBIN BUILDS

Range of spinning-bobbin builds for spooling at Barber-Colman spoolers is wide. So is range of spooler speeds and of slough-offs.

Typical data? Look at these:

- Build 48.5s filling with 2-in. ring, 9-in. bobbin, 3-lobe cam. Spooling speed, 3,000 fpm.
- Combination-wind from 3.50s to 36s yarn on 2- to 2½-in. rings with 8-in. stroke. Spooling speed, 3,900 fpm. Slough-offs not over 1½%.
- Combination build on warp frames, spin from 4s to 34s on 2- to 2⅛-in. rings, 10- and 10½-in. bobbins. Spooling speed, 25,000 to 36,000 fpm. Average slough-offs, 3.48%.

HOW THE EXPERTS SEE MAJOR CARDING PROBLEMS

1. GRANULAR CARDING

The Southern Regional Research Laboratory (SRRL) granular card needs more testing before it will be used on a production basis.

This view came clear in general floor discussion following a panel presentation. Even so, all mills but one now experimenting with the granular card (it operates without flats) plan to continue testing.

Here's a summary of merits and faults of the granular card mentioned by one supervisor or another:

Merits—Power costs are lower (only $7 per card per year in one mill). There's less waste. (One supervisor reported a cut of 50%, in fact.) And grinding is eliminated.

Faults—The granular card puts more trash in the web and produces more fly in the room. Nep count is greater at regular speeds (but on the other hand, no chokes fall on the screen). Also neps are larger. There has been some snowballing. Finally, yarn appearance and breaking strength leave something to be desired.

2. PICKER-LAP SCALES

Print-weight picker-lap scales make employees more careful. But mechanical malfunctions are troublesome.

Merits—With print-weight scales tenders are more careful to set the picker even. What's more, these scales keep reject laps out of production and show the exact number of rejects. Some mills report rejects no higher following installation of the scales.

Faults—Other mills report rejects with the print-weight scales run higher—anywhere from 5.3% up to 9 or 10%. These figures represent substantial increases, irrespective of lap size (from 52 to 60.8 yd. long, from 44 to 61.5 lb., and from ±0.75 lb. tolerance).

3. HIGH-COMPRESSION PICKERS

These work well on calender and delivery sections of pickers. But maintenance costs (for broken calender rolls and gears) may run higher.

Mixed feelings—They come out of comments like the following:

- "We make a 14-oz., 80-lb., 19-in.-dia. lap and truck it by hand. High-compression units have needed little maintenance except for replacement of 80T calender gears."
- "Custom-made pressure units on our calender rolls produce a 14.75-oz. lap that weigh 65 lb. Main-

. . . Turn the page

Begins on page 60

tenance costs for the pressure units is low. But we're breaking more calender rolls at the picker."

Handling methods—These include lap racks (for 15-oz., 80-lb., 17- to 18-in. dia. laps); a small electric hoist (with scales attached) to doff picker laps and place them on a truck; two men to rack and place laps on cards; doffing picker laps manually and moving them to the cards on lap trucks; and moving 12 laps at a time to the cards.

4. METALLIC CARD CLOTHING

In general, this decreases nep counts, reduces stripping, makes yarn that's more even. But it does produce more fly than fillet clothing.

Merits—Ten mills report nep count down anywhere from 40 to 67%, substantial cuts in waste and flat strips, strong improvement in variation, and more spinnable fibers. One mill, in fact, reports a 50% boost in production. Others report no change (or only slight change) in production and ends down. Most of them report either no data or just slight improvement in breaking strength and yarn evenness.

Faults—Some mills say carding and spinning fly has increased considerably. Some even report fly and shedding at later process stages.

5. CANS AND COILERS

More mills are installing large coilers and cans (some of them well over 40 lb. full) without creating handling or stripping problems.

Here's a rundown of comment on applications and methods:

- "Our cards are equipped with 18x42 coilers. Cans hold 42 lb. The card tender doffs cans onto a truck that holds eight units. Granted, it's a little harder to lift the stripping roll over the tall coiler. Even so, this doesn't bother us—we have metallic clothing that's stripped each week."
- "We use 15x42 cards coilers that holds 23 lb. Our 16x42 cans hold 39 lb. We move the cans by hand. We have no stripping problems."
- "We put 47 lb. in our 18x42 cans and push them along the floor. Our 16x42 drawing cans hold 35 lb. No trouble in stripping."

6. SPLIT-TOP FLATS

These reduce neps and cut grinding frequency. But they don't increase production.

Facts reported—One mill reports split-top flats have reduced neps 19%. Another says the cut is 33%—and that it has 26% fewer flat strips. One mill now grinds only once in three months. Another says its flats don't need grinding even after 18 months.

7. DRAWING CUT FIBERS

Opinion is divided on whether cut man-made fibers on metallic top rolls tend to crawl out of the spoons—and whether condensers are necessary.

Here are three views:

- "We now have no problems with cut fiber on metallic top rolls. We corrected the tendency for it to crawl out of the spoons by lowering sliver weight from 70 to 50 grains. We use a 12-in. tube gear with a 1½-in. tube, and a French-collar type of condenser between calender rolls and tube gear."
- "We've had problems with cut fiber caused by cored sliver, by high humidity and lint, and by rolls out of alinement. We've found condensers are unsatisfactory."
- "We've had no trouble from cut sliver. Correct roll speeds and settings are the reason. We hold drawing sliver in the spoons by small metallic shell rolls positioned just above and behind the spoons. These rolls revolve as the sliver passes beneath. For some types of man-made fibers we use nylon condensers."

8. LARGE PACKAGES

For large roving packages, random creeling is standard practice in Georgia mills.

Uniform method—Packages range from 12x6½ to 13½x7 in. size, from 3¼ to almost 5 lb. in weight. Spinners creel at random from the top of the roving creel or from boxes. One company feels the unbrella creel is a "must." Another stacks roving on top of the creels. Still another uses spring-bottom buggies that hold 27 full bobbins and have metal boxes hung on the front for empty bobbins.

9. ROVING ROLL CLEARERS

The problem: build-up of fly in the drafting system. There's open disagreement on the best type of roving roll clearer to use.

Some mills use sponge-rubber revolving clearers, others use flat clearers, still others use sleeve-type clearers. A few even use two types in combination. Here's how the supervisors see this problem:

- "We use sponge-rubber revolving clearers on front top rolls, a flat clearer (covered with nep-clearer cloth) on back top rolls. Fly is not excessive."
- "On top rolls: a revolving clearer on the front, revolving clearer on back and on apron. There's some fly build-up between apron and front rolls."
- "We're experimenting with a sheepskin clearer."

10. BLENDING COTTON

There are no big problems in blending rain-grown cotton with Western irrigated cotton. Or in blending compressed and flat cottons.

Tips on blending—Only safeguards needed are to feed local rain-grown cotton and irrigated cotton from different feeders and to adjust hopper-feed speeds to correspond to the percentage of blending desired.

11. COTTON CROP, 1959

It's inferior to the 1958 crop in terms of neps, breaking strengths, and machine stoppages.

Supervisors see nep count up to 10% higher, break factor to be 10% higher, ends down higher by 3% or more.

Textile World

CHEMICAL TREATMENT AND FINISHING

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Whether your carpet is wool, cotton, or nylon, Sandoz dyes and dyeing formulas can help you offer improved color fastness and levelness. Recent improvements credited to Sandoz technology include the dyeing of wool at the iso-electric point (using Lanasyn dyes and Lyogen SMK) and the barre-free dyeing of filament nylon with Lyogen P and Lyogen SF. For your cotton products, Sandoz provides the fastest-to-light directs (Lumicrease colors) as well as a full line of vat dyes. Sandoz can offer you shade matches completely compatible with all types of carpet backing.

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SANDOZ

THINKS AHEAD WITH TEXTILES

SANDOZ

For Good Wool-Acrylic Unions

A method of dyeing wool-Zefran mixtures to good unions in a wide range of shades has been developed by Dow Chemical Co., Textile Fibers Dept., Williamsburg, Va.

The dyeing system is based on the facts that certain neutral-dyeing premetallized colors will dye Zefran to light shades while leaving wool white or nearly white, and that selected acid milling colors will dye wool preferentially.

The dyer can thus combine the two classes of dyes to get any desired effect. In dark shades, the selected neutral-dyeing premetallized colors will dye the wool to some extent and the acid milling colors can be used to make the wool to shade.

If the neutral-dyeing premetallized dyes are lacking in brightness, the Zefran can be dyed with direct colors chosen to leave wool white.

Examples of typical dyebaths follow:

Beige
Set bath at pH 6.3 to 6.8 with:
1.0% Igepon T-33
5.0% Ammonium sulfate
1.0% Acetic acid
20.0% Sodium sulfate
Run 10 min. at 110 F.
Add:
0.050% Lanasyn Brown RL
0.012% Lumicrease Yellow EFUL
0.052% Alizarine Light Brown BL
0.010% Polar Yellow 5GN Conc.
0.002% Brilliant Alizarine Milling Violet FBL
Raise to 210 F. over 30 min.
Run at 210 F. for 60 min.
Rinse

Olive Green
2.50% Capracyl Green 2% (Du Pont)
0.10% Cibalan Orange RL (Ciba)
0.50% Supralan Olive Green BA (GDC)
0.75% Irganol Brill. Green 3GL (Geigy)
0.01% Acid Scarlet GL (Sandoz)
0.01% Wool Orange A (Geigy)

Red
1.25% Benzopurpurine 3B (GDC)
2.25% Chlorantine Fast Yellow RLSW (Ciba)
0.15% Xylene Red B (Sandoz)

Heavy Shade — Black
Set bath at pH 6.5 to 7.5 with:
1.0% Igepon T-33
5.0% Ammonium sulfate
20.0% Sodium sulfate
Run 10 min. at 110 F.
Add:
7.0% Viscolan Black B
4.0% Cibalan Black BGL
Raise to 210 F. over 30 min.
Run at 210 F. for 30 min.
Add 40.0% Sodium sulfate.
Run at 210 F. for 30 min.
Rinse

Bleach Raw Stock Continuously

Raw cotton in lap form can be bleached continuously, according to British Patent 829,835 issued to Smith & Nephew Textiles Ltd.

Cotton is taken directly from the bales and opened and cleaned in the usual manner. Picker laps are then made, and then are led down an inclined conveyor into a solution of a wetting agent and through a padder to give 100% liquor pickup.

The padding is important to consolidate and strengthen the lap. Next, the lap is saturated with sodium hypochlorite, sodium chlorite, or peroxide, and passed into a heating chamber at a temperature appropriate to the bleaching agent.

Storage in a J-box follows, likewise at a suitable temperature. Finally the lap is thoroughly washed, given a treatment in ¼% solution of soda ash, rinsed, squeezed out, and dried.

The bleached laps can then go directly to the cards to start conversion into yarn.

Binders May Affect Bactericidal Properties

Nonwoven fabrics that are used to make disposable diapers or dressings may lose their bactericidal properties if anionic substances are present in the fibrous material.

Cationic materials such as di-isobutyl-phenoxy-ethoxy-ethyl-dimethyl-benzyl ammonium chloride, or methyl-dodecyl-benzyl-trimethyl ammonium chloride, and alkyl dimethyl- (or diethyl-) benzyl ammonium chloride are often used to give deodorizing and bactericidal properties to such items.

However, if the binder that is used contains anionic substances, or if such material is present as impurities, the batts gradually lose their ability to kill bacteria or prevent odors.

A binder based on a vinyl acetate-ethylacrylate copolymer in a ratio of 75 to 25 has been found to be satisfactory for these purposes.

The binder is printed on the batts at intervals to produce a bond, and then the bactericide is likewise printed on to give a chemical content of about 0.2% based on fiber weight. According to British Patent 830,139, if the fiber is itself essentially nonionic, the resulting product will have a good shelf life.

New Bacteriostatic Finish

Bis-biguanides are the basic compounds used in bacteriostatic finishes recently developed. Bis-biguanides are substantive to cotton and rayon and do not lose their bactericidal properties even after repeated launderings.

Two compounds in this class that have proved to be satisfactory are 1:6-di-N_1:N'_1-parachlorophenyl-biguanido-N_5:N'_5) hexane, marketed as Chlorohexidine, and 1:6-di-(N_1-parachloro benzyl-biguanido-N_5:N'_5) hexane.

The chemicals are usually used in the form of their salts and are applied from an aqueous ethanol or propylene-glycol solution.

The compounds are effective against organisms such as *Staphylococcus aureus, Bacillus coli, Proteus vulgaris,* and *Pseudomonas pyrocyanea.*

Pressure Seals Speed Bleaching

Continuous peroxide bleaching at 20 to 25 psi. and temperatures to 265 F. is right on the verge of commercial application, according to an announcement by Becco Chemical Div., Food Machinery & Chemical Corp., Buffalo, N. Y.

The new method is based on open-width treatment of cotton goods and depends for its success on the development of a rotary pressure seal that will maintain the necessary pressure while cloth moves continuously through the specially designed treating chamber.

The pressure seal was designed and patented by James Hunter Machine Co., North Adams, Mass.

Trial runs made at the company's Chemical Research & Development Center at Princeton, N. J., show that with only 60 sec. exposure at 22 to 24 psi. and 265 F., a variety of cotton goods has been satisfactorily bottomed and bleached.

$KMnO_4$ Process Shrinkproofs Wool

Potassium permanganate applied to wool from a saturated solution of common salt appears to have advantages over other oxidizing materials that are commonly used to reduce shrinkage in woolen goods.

Research at Commonwealth Scientific and Industrial Research Organization (CSIRO), Geelong, Australia, shows that 5% of $KMnO_4$, based on the weight of the wool, is sufficient to produce excellent results. The saturated solution of common salt is used as a standing bath in conventional equipment, which may be made of wood, resin-

bonded glass fiber, or stainless steel.

Piece goods, yarn, or tops have all been treated successfully by the method. Chemical control of the bath is very simple: The reaction can be followed visually as the pink color of the $KMnO_4$ is reduced by exhaustion.

Assistants Help Disperse-Dye Absorption

Deeper shades on printed triacetate- or polyester-fiber fabrics are possible with the aid of new assistants developed by Farbwerke Hoechst A.G., Germany. The products are based on ethers or esters of polyhydric alcohols and a polybasic inorganic acid such as ortho phosphoric acid.

Examples given in British Patent 827,731 include the primary phosphoric acid ester of the condensation product obtained from one mole of dodecyl alcohol and four or eight moles of ethylene oxide. Similar tertiary phosphoric acid esters based on a polyethylene glycol of molecular weight of about 200, which has been further esterified with stearic or palmitic acid, are also useful.

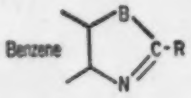
The assistants increase the power of known dye carriers that are also added to print pastes. An effective dye carrier for printing is based on benzyl benzoate mixed with the octaglycol ether of oleyl alcohol.

Prints made with the help of the new assistants should be fixed by heating at 140 to 220° C. for 5 min.

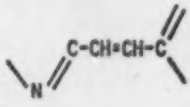
Versatile Acrylic-Fiber Brighteners

Optical brighteners for polyacrylic fibers that can be applied during bleaching, dyeing, or finishing processes are based on a new structure developed by Ciba.

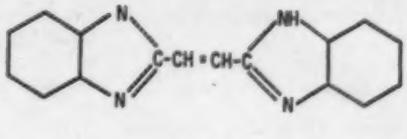
Instead of being derivatives of 4:4-diaminostilbene 2:2-disulfonic acid, the new products stem from a molecular structure of the type:



in which B represents an oxygen, sulfur, or nitrogen atom, and in which R represents a carbon chain (open or ring), which with the N=C group of the above nucleus contains at least three conjugated double bonds of the type:



A typical optical brightener of this type is a, B-di-[benzimidazolyl-(2)]-ethylene:



Did You Know

. . . that cellulosic material must be present to form hydrochloric acid when a chlorine-bearing resin is heated? Research by Dr. Lee Wayland, Assistant Director of Research, Dan River Mills, Danville, Va., shows that unless cellulose is present, heat releases only Cl_2 from the chlorine-resin compound. Apparently OH groups found in cellulose are necessary to produce the destructive HCl when a resin-treated chlorine-bleached fabric is ironed.

NEW DYES AND CHEMICALS

Softener

Softener A . . . is a general-purpose softener that works well on natural or man-made fibers. The amphoteric substance provides a full, soft hand to woven or knitted fabrics and has excellent resistance to yellowing. The lightfastness of shades is not affected by the softener. W. F. Fancourt Co. **(Circle D-1 on Reader-Service Card)**

Coupling Agents

Fast Gray Salt G and Fast Gray Salt B . . . produce dischargeable naphthol grays that have excellent fasteness to light, washing, and chlorine.

Fast Blue Salt OT . . . produces fast, dischargeable navy blue shades on naphthol bases. The salt contains a buffer that eliminates the need for additions to the developing bath. Carbic-Hoechst Corp. **(Circle D-2 on Reader-Service Card)**

Reactive Acrylic Latex

Hycar 2671 . . . can be used in fabric-backing formulas, as a binder for nonwoven fabrics, and as an adhesive or laminating agent. The material resists laundering and drycleaning and has excellent ageing properties. B. F. Goodrich Chemical Co. **(Circle D-3 on Reader-Service Card)**

Disperse Dye

Dacryl Green LFG . . . produces true green shades on polyamide, polyester, and acetate fibers.

The dye may be applied at normal dyeing temperatures with carriers, or it can be used at elevated temperatures without a carrier. It exhausts well in neutral dyebaths and has superior pile-on characteristics.

Fastness is excellent to washing, drycleaning, sublimation, and light. The color is recommended for dyeing stock, yarn, or piece goods. **Circle D-4 on Reader-Service Card)**

Water-Soluble Resin

Cellosize OP-4400 . . . is a nonionic thickener based on hydroxyethyl cellulose. The product dissolves quickly in water with no agglomeration and produces high-viscosity gels at low concentrations. Textile applications include production of print pastes and slashing formulas. Union Carbide Chemicals Co. **(Circle D-5 on Reader-Service Card)**

Catalyst

Catalyst MC . . . is a modified zinc complex that is recommended for curing resins applied to cotton fabrics. The catalyst is claimed to furnish maximum chlorine resistance to resin-treated fabrics that are chlorinated under correct household or laundry conditions. Hamilton Chemical Corp. **(Circle D-6 on Reader-Service Card)**

Dyeing Assistant

Uniperol AN . . . helps produce level dyeing on polyacrylonitrile fibers. The product is cationic and has an affinity for the fiber, which explains its leveling action. When used with basic or cationic dyes, the assistant temporarily occupies dye sites but does not prevent good build up of shade. Putnam Chemical Co. **(Circle D-7 on Reader-Service Card)**

Scouring Agent

Fantex O&W . . . is effective in removing heavy, oily, or waxy soil on most fibers. It is particularly recommended for use in package machines, jigs, and Burlington units where its low-foaming qualities are desirable.

The product has an initial pH of 9.5 and has amphoteric properties that produce a peptizing effect when used in conjunction with alkalies. The material is supplied with a lower pH for use in wool scouring. W. F. Fancourt Co. **(Circle D-8 on Reader-Service Card)**

Vat Dye

Calcoloid Olive TL Single Paste . . . is level dyeing in all conventional vat-dyeing processes and is characterized by excellent coverage and working properties.

The dye has top fastness to light, weather, abrasion, chlorine, and laundering. The shade is well adapted to the production of olive greens commonly used in workclothes fabrics and sportswear. American Cyanamid Co., Dyes Dept. **(Circle D-9 on Reader-Service Card)**

UV Light Absorber

Cyasorb UV 314 . . . is specifically designed to protect polyethylene and polypropylene fibers and films from the action of ultraviolet light.

Quantities of the material as low as 0.5% serve to protect olefin materials from exposure to sunlight so that up to 88% elongation is retained after four months exposure to severe sunlight conditions in Arizona. Rope, auto upholstery, and lawn furniture are suggested applications in the textile field. American Cyanamid Co. **(Circle D-10 on Reader-Service Card)**

Hosiery Finish

Resin BDC . . . gives a full luxurious body and improved snag resistance to nylon hosiery that is finished with this material. The resin is compatible with the manufacturer's other nylon finishes and lubricants and does not cause sticking of the hose to supports in any type of drying, including postboarding. W. F. Fancourt Co. **(Circle D-11 on Reader-Service Card)**

What's in back of today's better-quality carpets?

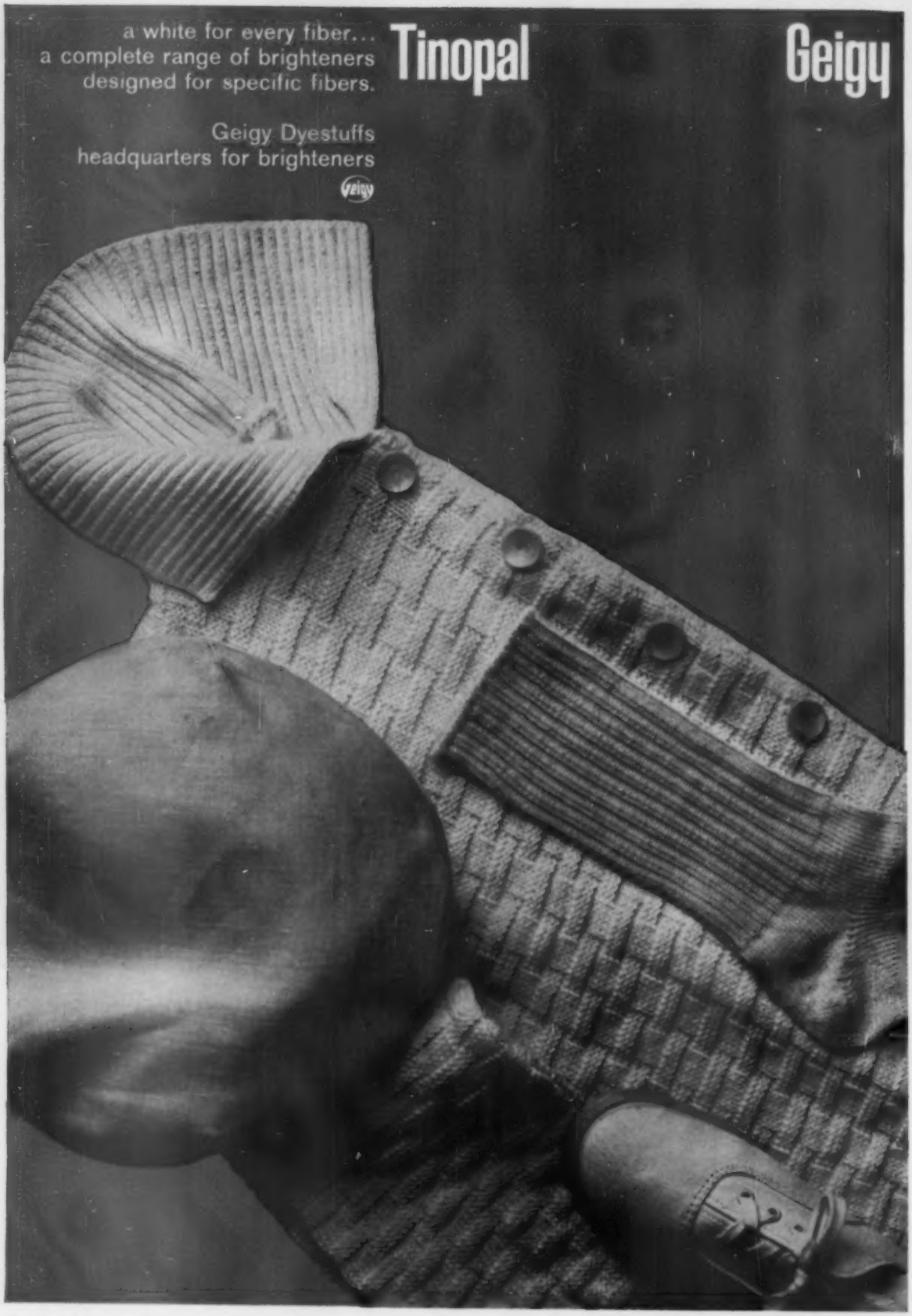
New DYLEX® K-40 latex allows better carpet backings at less cost to the manufacturer. It needs no accelerators, no vulcanizing agents of any kind. You can use simpler, less expensive mixing equipment. DYLEX K-40 is easy to mix—merely add filler and a small amount of dispersant. A wider range of dyestuffs can be used with new DYLEX K-40. There's no danger of a reaction with certain dyes.

Carpet backings made with DYLEX K-40 give you "soft hand" · · · and they stay flexible!

See for yourself. Send for a carpet sample backed with DYLEX K-40. Check its softness. Note its flexibility. Test its aging qualities. You'll see why you should use new DYLEX K-40 in rug backing compounds! Write Koppers Company, Inc., Plastics Division, TW-60, Pittsburgh 19, Pennsylvania. Offices in Principal Cities • In Canada: Dominion Anilines and Chemicals Ltd., Toronto, Ontario.

KOPPERS PLASTICS

CIRCLE 69 ON READER SERVICE CARD 69


a white for every fiber...
a complete range of brighteners
designed for specific fibers.
Tinopal
Geigy
Geigy Dyestuffs
headquarters for brighteners
Geigy

Local and state laws are getting tough about mill-waste disposal. It's a hard problem. But today, with new methods and better equipment, waste disposal isn't the costly job it once was. That's why you'll want to hear the . . .

Latest Word on Low-Cost Mill-Waste Disposal

IF YOU'RE UNDER THE GUN —have to clean up the streams into which your mill discharges its waste —here's news: Today, it's possible to dispose of waste at lower costs, with smaller plants, and with better results than ever. In fact, in the past five years, many new waste-disposal plants have been set up to operate on principles once thought impractical by leading sanitary engineers.

Mill wastes have three primary characteristics—all of which used to be far more costly to overcome than they are today. The distinguishing elements:

- Mill wastes tend to be high in biological oxygen demand (B.O.D.).
- They are often highly alkaline (and in some instances are highly colored).
- Often they smell bad (particularly if they are sulfur-dye wastes).

What's a typical set of symptoms for textile-mill waste? Take an integrated cotton mill as an example. Its composite waste will assay at pH of 8 to 11, will have a grayish collodial turbidity, and will contain total solids in the amount of 1,000 to 1,600 ppm. The color will be that of the predominant dye in use. Total alkalinity will vary from 300 to 900 ppm., suspended solids will range from 30 to 50 ppm., and the chromium content may get as high as 3 ppm.

Volume of waste from the typical cotton-processing plant will be considerable—will vary from 30,000 to 93,000 gal. per 1,000 yd. of finished cloth.

You'll get a good idea of the type and extent of polluting material that is contained in the waste from an integrated weaving and finishing plant. (See Note 1, panel, p. 72.)

COSTLY TREATMENT

In large metropolitan areas, city sewage-disposal plant management often takes a dim view of the highly alkaline wastes turned into sewage systems by integrated textile plants located within city sewage districts. Plants in these situations usually have to neutralize the alkalinity of their wastes with acids before discharging them into sewage systems. Costs vary with volume and alkalinity, but can run to $150,000 or more annually in a good-sized integrated plant.

The primary objection to neutralizing procedures is the cost of chemicals. Holding basins, small lagoons, metering equipment, and necessary manpower are added items.

The treatment usually recommented in the past for textile dye wastes has been chemical precipitation. This method is generally satisfactory, whether used alone or in combination with lagooning as a prior treatment.

But plant facilities for a full-scale precipitation system begin to run into important money. When you add up the cost of an equalization basin, rapid mix basin, settling tanks or lagoons, chemical feeders, controls, mixing devices, pH meters, and recording instruments necessary for a workable setup, the sum is considerable. And chemical cost is another large factor.

The cost of precipitating wastes from a dyehouse that uses a variety of dyes and includes wastes from

. . . *Turn the page*

Begins on page 71

kier boiling is well illustrated in Table II (see Note 1, p. 73). In addition, if there are wastes high in reducing power, they should be separated and treated with oxidizing materials before the effluent is sent to the stream. Otherwise aquatic life may be destroyed.

5 Ways You Can Handle Mill Wastes

Mills that are being pushed by state law-enforcement agencies to reduce stream pollution can often help their situation by cutting the volume of raw waste sent to the receiving stream, reducing its alkalinity, modifying processes, recovering some chemicals, and even substituting chemicals where it is practical.

1. Cut Waste Volume

One can cut waste volume by extending the principle of counterflow washing and the use of final rinse waters for new dyebaths.

A well-established method of reducing alkalinity of waste is to use mercerizer wash waters for kier-boiling or prescouring in continuous bleaching ranges.

Separation of highly charged wastes from waste only slightly contaminated is also practical and cuts down the load on any treatment plant. Often the less objectionable waste can go directly to the receiving stream. The principal disadvantage of waste separation in older plants is the cost of new piping to handle the waste.

Excess chemical content in mill wastes often comes from guesswork involved in the use of processing chemicals. A detailed study of all processes, with rigid adherence to minimums established by careful tests, has helped some plants with waste-disposal problems and at the same time cut chemical costs.

The recovery of caustic is also practical for a mill if its caustic

Table 1— WHAT YOU'LL FIND IN A TYPICAL MILL EFFLUENT

Wastes	pH	Alkalinity (ppm.) Total	CO_3	HCO_3	OH	B.O.D. (ppm.)	Total solids (ppm.)
Slasher waste (Cone Mills Lab Research):							
Strong	9.2	1,040	248	800	0	37,700	76,976
(From machine)	8.9	660	0	660	0	36,000	77,247
Weak	7.2	34	0	34	0	1,800	4,078
(Washing from kettles)	8.4	52	12	40	0	1,885	3,308
Desizing waste: Starch	7.2	202	0	202	0	5,130	23,000
Kiering waste:							
Pressure kier	13.1	20,240	1,860	0	18,480	1,840	26,740
Open kier							
First boil	10.0	10,000	7,800	2,200	0	3,750	19,642
Second boil	9.8	7,400	5,800	1,600	0	2,280	16,064
Continuous boil-off	13.1	20,400	6,600	0	13,800	5,750	39,605
Hot rinse	11.8	265	90	175	0	63	366
Bleaching wastes:							
Chlorine	9.5	310	90	220	0	119	2,310
Peroxide	9.6	1,265	560	705	0	1,200	9,040
Mercerizing waste:	12.1	9,282	275	0	9,007	15	10,398
Rinse	9.6	125	110	0	15	52	841
Dyeing waste:							
Aniline black	——	38	0	38	0	40	831
Basic	6.3	65	0	65	0	167	628
Developed	6.9	——	——	——	——	200	8,140
Direct	7.5	81	0	81	0	337	9,400
Indigo alk. wash	11.9	2,700	1,910	790	0	2,080	5,834
Indigo wash	11.25	2,200	1,400	800	0	928	1,132
Naphthol	9.5	1,310	1,084	0	226	108	8,475
Sulfur bath	10.5	4,200	3,600	600	0	3,000	36,980
Vat	9.6	714	660	0	54	129	1,770
Color shop wash wastes	9.0	193	0	193	0	133	2,880
Finishing (Cone Mills Lab: Research)							
Strong (from machine)	8.8	490	65	425	0	13,600	41,646
Weak (washing)	7.1	37	0	37	0	680	2,050

What a Mill Discharges in Waste . . .
. . . And Where You Can Look

1. **An Industrial Waste Guide to the Cotton Textile Industry,** Public Health Service Publication No. 677. Available from the Supt. of Documents, Washington, D. C. Price 25¢. (Prepared by AATCC Piedmont Section, Stream Sanitation Committee.)
2. Souther, R. H., and Alspaugh, T. A., **Textile Wastes Recovery and Treatment,** presented before the Tennessee-Kentucky Section, Federation of Sewage and Industrial Waste Associations, Sept. 1956: Sewage and Industrial Wastes, Aug. 1957.
3. Burford, M. G., Masselli, J. R. Snow, W., Campbell, H., and Deluise, F., **Industrial Waste Surveys of Two New England Cotton Finishing Plants,** New England Interstate Water Pollution Control Commission (1953).
4. Souther, R. H., and Alspaugh, T. A., **Biological Treatment of Mix-**

Table 2—WHAT IT COSTS TO TREAT EFFLUENT BY CHEMICAL PRECIPITATION

Dye Wastes	Chemicals used (lb. per 1,000 gal.)		Cost (cents per 1,000 gal.)	Percent removal		For help, see notes bearing these numbers.
				B.O.D.	Color	
Aniline black wash water	Alum	0.9	2.6	——	84.0	6
	Lime	.4				
	Copperas	2.3	3.6	——	80.0	
	Lime	.6				
Developed dye waste composite:	Copperas	11.6	17.3	——	85.0	6
	Lime	2.1				
Dye vat, diazotized vat, developed vat	Ferric sulfate	18.3	48.5	——	65.0	
	Lime	10.5				
Direct dye waste	Ferric sulfate	2.8	5.9	——	75.0	6
Indigo waste liquor	Lime	7.0	6.7	——	65.0	2
	Copperas	5.8	17.7	——	94.5	
	Lime	12.5				
Naphthol waste mixture Naphthol, caustic, oil, dye bath	Sulfuric acid	21.8	20.2	——	99.0	6
Sulfur dye waste	Sulfuric acid	36.5	33.4	——	99.0	2
	Alum	58.0	141.0	——	99.0	
Vat dye waste	Copperas	92.8	134.0	——	85.0	6
	Lime	12.5				
Kier waste	Alum	83.7	200.0	——	99.5	2
	Copperas	145.0	204.0	——	98.0	
	Lime	12.6				
MIXED WASTES						
Sulfur and indigo dye	Copperas	5.85	13.4	41.5	91.0	2
	Lime	5.85				
	Alum	20.9	57.0	43.7	97.5	
	Acid	6.5				
Kier, finishing, dyeing color shop, mercerizing	Copperas	4.2	5.5	18.9	0	2
	$CaCl_2$	5.0	9.3	49.5	60.0	
	Copperas	6.2	10.12	41.2	30.0	
	Lime	2.2				
	Copperas	4.2	5.5	20.0	50.0	2
	Copperas	5.8	14.2	59.5	83.5	
	Lime	5.8				
	$CaCl_2$	8.4	15.5	47.5	83.0	
Dyeing and finishing	Copperas	5.85	7.75	42.4	80.0	2
	Copperas	4.2	9.55	52.5	80.0	
	Lime	4.2				
Mixed dye waste	Cl_2	4.5	20.2	30–40	90.0	2

What It Costs to Clean Up . . .

For More Information

tures of Highly Alkaline Textile Wastes and Domestic Sewage, II, Sewage and Industrial Wastes, 28, No. 2, pp. 166-176 (Feb. 1956).

5. Souther, R. H., and Alspaugh, T. A., **Biological Treatment of Mixtures of Highly Alkaline Textile Mill Waste and Sewage,** American Dyestuff Reporter, 44, pp. 390-395 (1955).

6. Porges, R., Horton, R. K., and Baith, H. G., **Chemical Precipitation of Textile Wastes and Studies of pH Control,** Sewage Works Journal XI, No. 5, pp. 828-857 (1939).

7. Smith, A. L., and Grey, J. C., **The Evolution of a Waste Treatment Scheme at Chatham Manufacturing Co.,** presented before Ninth Southern Municipal and Industrial Waste Conference, April, 1960.

wastes exceed 400 tons annually at a minimum wash-water concentration of 2% NaOH.

2. Change Your Process

Sometimes you can modify the process. For instance, one raw-stock sulfur-dyeing operation, which was resulting in alkaline and foul-smelling wastes, has been made more economical and less troublesome by reuse of spent dyebaths. Instead of dumping the used bath, management now pumps the waste to a receiving tank and uses it again as the base for a following batch of cotton stock. Management finds heat and chemical costs are reduced while stream pollution is cut. (See Note 2).

There's a definite trend toward the use of carboxymethyl cellulose (CMC) in place of starch for warp sizing operations. Why? Because CMC makes little or no biological oxygen demand on the receiving stream. This way, it is helping solve stream pollution problems for some gray mills whose primary troubles sprang from starchy residues. Substitution of acetic acid for mineral acids is often possible in dyeing operations and may cut pollution loads by 10 to 22%. (See Note 3).

Synthetic detergents have replaced soap in some operations. This substitution may reduce stream pollution by as much as 50%. But the persistency of foaming that is characteristic of syndets even in extremely minute quantities sometimes raises other problems.

Studies made at the University of California on methods of removing or destroying the alkyl benzene sulfonates (ABS) that are the base of most syndets show that induced frothing followed by incineration of the froth will remove 90% of ABS residues in sewage. The complete report of these studies was made to

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Newest Approach to Steam Pollution Abatement:

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the American Association of Soap and Glycerine Producers, Inc., in Jan. 1960.

The ABS content of effluents is posing a serious problem today, both to industry and to municipalities because these syndets are almost indestructible and are creeping even into subsurface waters that supply drinking water to the communities. One ppm. of ABS is enough to produce a froth on water. But this condition poses no sanitation problem.

Treating mixed wastes—As a result of work done by R. Hobart Souther and T. A. Alspaugh (see Notes 4 and 5, p. 72) on the treatment of mixtures of mill waste from a fully integrated mill and sewage from the mill community, Cannon Mills Plant No. 1 at Kannapolis, N. C., has set up a good, new waste-disposal system.

Cannon has enlarged and modified its original sewage-treatment plant to handle the added load and to accommodate the chemical content of the mill waste. The mill wastes that account for 90% of the B.O.D. are produced from the desizing operations and the scouring of goods preliminary to bleaching. Dyehouse liquors as such are low in B.O.D. and present only an occasional color problem. Early laboratory studies showed that biological treatment of desizing and scouring wastes along with sewage was possible in spite of the rather high alkalinity of the scouring wastes.

3. Separate the Wastes

Cannon used to lead desizing and scouring wastes into the sewage-treatment plant together, but soon found that the desizing waste could be handled more satisfactorily if treated separately. The desizing wastes decompose rapidly, and when separately transported can be treated immediately.

It also became apparent that the caustic content of mixed desizing and scouring wastes dissolved considerable starch and thus increased the B.O.D. load on the rest of the plant. Separation of the wastes through the primary-clarification step overcame this problem.

Cannon discovered that its ventilating system for the trickle filters had to be boosted to prevent the development of odors due to anaerobic bacteria that developed in summer months. Four fans that discharge air into the under-drain system of the filters now provide the needed ventilation during weekends and early-morning hours. Wastewater temperatures and ambient temperatures are nearly equal during 60% of an average summer day. This condition retards ventilation and causes depletion of the dissolved oxygen in the waste as it trickles through the first-stage filter. In this situation anaerobic bacteria grow—and produce the foul odor.

Cannon's wastes now are piped to a lagoon big enough to hold this waste for several days. The caustic lagoon serves two purposes. It provides an adequate supply of alkali, which mixes with the desizing operation wastes and thus reduce the rate of decomposition. And during the holding period, a good deal of the caustic reverts to carbonates, which lower the pH of the lagoon's contents.

How Cannon set up its plant.—Beside the lagoon, the treatment plant consists of primary clarifiers, trickle filters, chlorine contact tanks, sludge digesters, and a vacuum system for sludge filtration.

Cannon's engineering department designed and built the plant and completed it in June 1956.

The mixture of plant wastes and sewage is about 60-40. It flows to the plant at a rate of 2.5-million gal. per day.

Cannon gets a better settling of suspended matter in the desizing waste by adding lime to the waste to speed up coagulation.

The first-stage trickling filters are fed a combination of sewage, settled desizing wastes, and caustic liquors from the lagoon. The pH averages 11.5—much higher than that of normal sewage-treatment plants. The bacteria that feed on the organic matter present have been conditioned to this high pH. Thus it is not necessary to neutralize the caustic liquors before treatment. In fact, the alkalinity is used to control decomposition in the desizing wastes.

Keeping B.O.D. loading high—The trickle filters are designed to handle 4 lb. B.O.D. per cubic yard of stone, about twice the capacity of regular sewage-plant filters. In summer the load may be as high as 7 to 10 lb. B.O.D. per cubic yard of stone. Removal of 4 to 5 lb. B.O.D. has been obtained. Recirculation of liquor is important in attaining such a high B.O.D. removal from liquors that run as high as 1,800 to 2,000 ppm. B.O.D.

Effluent from the first set of trickling filters is led to a second pair of trickling filters to reduce B.O.D. to the minimum.

The product of the trickling filters is pumped to the chlorine-contact tank, where it is chlorinated at a rate determined by analysis, then discharged to the stream.

Decomposing waste—The sludge that settles out of the starch wastes and sewage is pumped to huge digesters that promote decomposition. Decomposition generates large quantities of methane gas, which maintains a digester temperature of 95 to 100° F. Digestion, aided by recirculation of supernatant liquid through inlet pipes in the floating covers, is completed in 10 days.

Residual sludge with low organic content is removed from the bottom of the digesters. A vacuum extrac-

tor separates it from entrained liquids. The product is hauled away and buried.

A complete report on the operation of Cannon Mills waste-disposal plant was made to the Textile Engineering Conference, Raleigh, N. C., by John L. Brown, sanitary engineer for Cannon. Copies are available from the American Society of Mechanical Engineers, 29 W. 39th St., New York 18, N. Y.

4. Build an Aeration System

The newest approach to stream pollution abatement is a stepped-up aeration process based on lagooning.

Textile plants that have enough land have long used simple lagoons without aeration as stop-gaps or partial answers to stream-pollution problems. The trouble with such lagoons is that they fill up. Then, too, the effects of time, sunlight, and surface aeration are often not enough to produce a suitable effluent. Deep lagoons may also develop heavy anaerobic growths that cause foul odors in hot weather. Aerated lagoons help solve these problems.

The aeration process was originally developed by R. H. Souther to treat a mixture of sewage and mill waste at Cone Mills' Haw River (N. C.) plant. It is now accepted by the N. C. Stream & Sanitation Committee. The U. S. Public Health Service has granted the town of Haw River $138,000 to help build the full-scale plant. Other mills interested in this process include Burlington Industries' Mooresville (N. C.) plant, Canton Mills at Canton, Ga. and Cone Mills' Greensboro (N. C.) plants. Canton's experimental results range up to 96% B.O.D. removal.

In the aeration system, a lagoon of sufficient size is built to hold the total waste expected for a two-or-three-day period. At the inlet end, a mixing basin is fitted with a strainer to remove any undigestible solid matter. At the delivery end there is a settling basin with or without provision for pumping back a portion of the sludge to the entering end of the lagoon.

In operation, air pumps into the lagoon at the entering end through distribution pipes. The air circulates the waste and provides oxygen for the aerobic bacteria.

Digestion is brought into balance by regulating air flow and, where necessary, by introducing sludge from the settling basin at the delivery end of the lagoon. This sludge is rich in bacteria, which feed on the nutrients in the mill waste-sewage mixture.

The clear effluent from the top of the settling basin discharges into the stream at a B.O.D. reduction rate of 80 to 95%. Sludge does not accumulate in the lagoon because the organic matter is totally destroyed and the soluble salts from the textile waste are, of course, carried through in solution.

Another method of introducing air is by mechanical entrainment produced by agitation in a mixer installed ahead of the lagoon. Cone Mills' Proximity and White Oak Plants at Greensboro and Burlington Industries' Mooresville plant are now experimenting with this method.

Installation and operating costs for a biological aeration lagoon are considerably less than for the standard sewage disposal plant. Estimates are that the system works at ⅙ to ⅓ the cost of the older methods.

Where space is available and the climate is warm and sunny, a shallow stabilization pond may fill the needs of a textile plant for low-cost waste disposal. In these ponds the waste may become anaerobic and develop objectionable odors because of lack of aeration.

Further experimental work on the entire subject of lagooning (with and without aeration) for treating textile-sewage wastes has been proposed by the Chemical Processing Subcommittee of the National Technical Task Committee on Industrial Wastes.

5. Use the Bisorption System

The bisorption process, a modification of the activated sludge system of waste disposal, does not require the large trickle filters common to sewage disposal plants.

In this method compressed air or mechanical mixing keeps sludge (supplied with aerobic bacteria) well agitated. The air supplies the necessary oxygen for biological activity. The process is made self-perpetuating by withdrawing and settling the mixture and recycling a portion of the biologically active sludge to mix with fresh waste.

The effluent is clear and stable. B.O.D. is reduced up to 95%. But the system is more sensitive to changes in the waste characteristics than the trickle filter system. Both pH and waste equalization have to be carefully controlled. Sludge has to be removed periodically.

Good results have been reported by A. L. Smith and J. C. Grey, Chatham Mfg. Co., Elkin, N. C., on pilot-plant treatment of wool and synthetic wastes in a high-rate activated sludge or modified bisorption method. (See Note 7, p. 73). The principal advantages are lower space requirements and lower installation costs.

Take Your Pick

That's the wrap-up on current trends in treatment of mill wastes. The meaning to you is this: If you're faced with a serious pollution problem—and there are many—you have a wider choice of possible solutions to your problem than ever.

Checking behavior of new finish under controlled humidity

Measuring crease-recovery of differently treated fabrics

Forming fiber web specimen for test of non-woven fabric binder

ROHM & HAAS TEXTILE RESEARCH

Experimentally treated fabric takes tensile strength test

How Rohm & Haas

TEXTILE TEAMWORK

puts new ideas to work for you

You're getting more—much more—than simply one man's opinion, when you discuss wet processing problems with the Rohm & Haas Textile Service man who calls on your company.

It's the field man's job to bring you the newest ideas of some of the most capable textile chemists in the business . . . the men who developed such outstanding products as ACRYSOL, RHOPLEX, RHONITE, RHOZYME and TRITON. He's just one member of a highly experienced team. And the *whole team* is working for you.

Textile research is a full time occupation of this team of yours. Over the years this research has created something of dollars-and-cents benefit to you, something not duplicated in any other line of textile chemicals, namely: a chemical for virtually every wet processing operation—warp sizing, fabric preparation, dyeing, printing, finishing.

The best thing about this service—the team is on the Rohm & Haas payroll, even though everyone on it is working for you.

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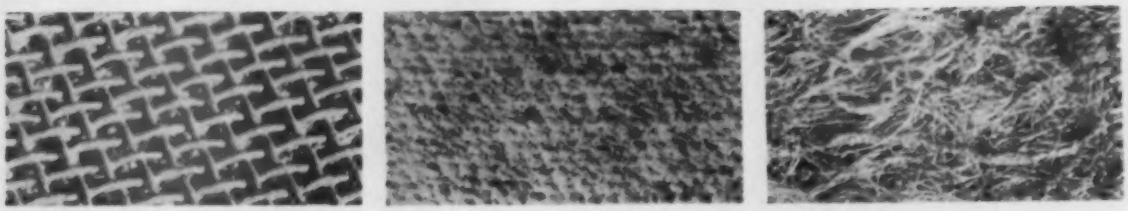
CHEMISTS AND TECHNICIANS AT WORK



Chemistry and Application of Rug-Backing Compounds—Part V

Getting a Top-Notch Finished Backing

By GEORGE BRAWNER, Coatings Consultant, Columbus, Ga.

DISCOLORATION, lower film strength, weaker adhesion, lower tear resistance. Those are just a few of the problems that come up when carpet-backing compounds undergo chemical change due to external influences.

Trouble is, there are many possible spoilers that can make carpet-backing go wrong. For example, exposure of backing to oils, solvents, waxes, paints, metals, fumes, heat, light, water, soap, alkalis, and acids can affect the physical properties of a compound. Even plain air can kick up a fuss.

Solution to the problem: Add antioxidants, which help you prevent—or at least control—undesirable chemical changes. An antioxidant works in one of two ways: Either it prevents breakdown of the elastomer, or it absorbs the by-products of the attacking medium before there's any damage to the elastomer.

But even if you have taken these preventive steps, too much heat in drying and curing can stir up trouble by affecting the useful life of backing compounds. And in gas-fired ovens there is also the danger of breaking down the backing compound and causing gas fading of the colors in some types of carpet.

Extreme drying conditions (such as exposing the backing to 425° F. temperature for 20 min.) often produce backings just on the borderline of discoloration. That's why laboratory tests of a backing compounds should be conducted under the same conditions that the product will encounter in production.

TIME—ENEMY OF QUALITY

Ageing is an important factor in the degradation of carpet backings. Sometimes carpets are rolled or stacked before they are completely cooled from the drying operation. Heat and entrapped exhaust gases from the dryer then may cause odors in the plant, the retail store, or in the consumer's home. Often you can blame H_2S (smells like rotten eggs), which is likely to be caused by bacterial growth within the latex itself. On the other hand, you can use fungicides to inhibit bacterial growth that might cause such smells.

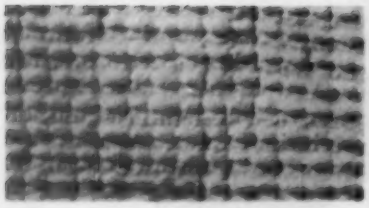
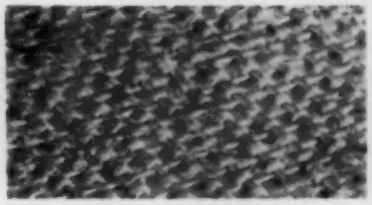
But the problem of time-ageing is greatest after the goods are shipped. They may be sold in a week or may remain the the store for a year, subject to wide variations in temperature and humidity. The carpets may be shipped to areas where there are heavy concentrations of industrial gases. Or they may be laid in a home heated by open gas heaters. Other enemies of the backing are direct sunlight and and the ozone content of air.

WHAT ANTIOXIDANTS DO

Antioxidants, included in the compound at a rate of 1 to 2%, help to protect against gas-fading, air oxidation, ozone, and ultraviolet rays. Some types (such as the amine derivatives) give good protection against excessive heat. These compounds tend to stain the backing somewhat, but are generally more effective than the nonstaining types based on phenol and hydroquinone. The latter will protect light-colored backings against sunlight but have less effect on other influences.

No one antioxidant will serve for all purposes. You must usually base your choice on the results of laboratory tests in which the backings have been exposed to ultraviolet light, heat, or gas fumes.

The backings of washable rugs can be damaged by chlorine-containing detergents or bleaching ma-

terials that can produce hydrochloric acid by picking up hydrogen from the backing compound. A backing that is susceptible to the chlorine-hydrogen reaction may discolor during the laundering or when it is dried.

Acid acceptors that are included in the compound formula will help prevent discoloration from this source. Any degree of discoloration indicates a loss of some other properties. So backings that will be subject to launderings should be thoroughly tested for resistance to chlorine and detergents in general.

HOW TO TEST COMPOUNDS

To insure yourself a quality product check these points:

(1) Stability—To test backing compounds you can put a sample in a square pint jar and stir it with a soda-fountain type mixer. A satisfactory backing compound should not coagulate in less than 15 min. by this test. Another method that tests resistance to coagulation is to put a sample of the compound in a round pint jar along with some ball-mill pebbles and rotate the jar at 60 rpm. Watch the sample for 24 to 72 hr. for floc formation.

(2) Resistance—You can check resistance to small amounts of vibration that might affect emulsion stability by placing a sample of the compound in a jar and letting it sit in an area where there is small but real vibration from machinery. Keep your eye on the sample for 24 hr. to note if the emulsion creams, breaks, or filler settles out.

(3) Viscosity—A good way to check viscosity is to use a Brookfield viscosimeter #3 at 60 rpm., or other combinations (if they are required). Check the sample for weight per gallon after any occluded air is driven out.

(4) Solids—You can check total solids by reweighing weighed samples after drying them at 70°C. for 16 hr. Inert material used for filler is usually reported in parts per hundred of dry rubber.

(5) Film-forming—You will get an idea of the film-forming and bending qualities of a backing compound by mixing one part of uncured compound with one part of chloroform and stirring the mixture well. After 2 to 3 min. remove the coagulated latex and pull it apart in your fingers. Ratings are recorded from 1 to 4, according to whether the coagulum (1) is tacky and stringy, (2) breaks apart under pressure, (3) falls apart easily, or (4) disintegrates without touching.

(6) Heat—You'll be able to estimate the effects of heat on the compound by exposing a dried sample for 16 hr. at 280° F. and then comparing it with the control sample for color change and stiffening.

(7) Light—A backing compound should also be checked in a Fade-Ometer to note the effect of light. A compound should show no significant change in color or stiffness in 40 hr. of exposure, but many compounders check their products at 20, 40, 60, and 80 hr.

TESTING

Viscosity and foaming tests should be continued over a period of time if you are going to evaluate the working characteristics of a compound precisely. And it's well to bear in mind that if a compound foams excessively, it may contain too much stabilizer; if it coagulates prematurely, it lacks sufficient stabilizer.

You ought to check your precoat compounds by washing and bleaching test pieces under end-use conditions. Tuft lock should be checked by standard methods or with a tensile-strength tester.

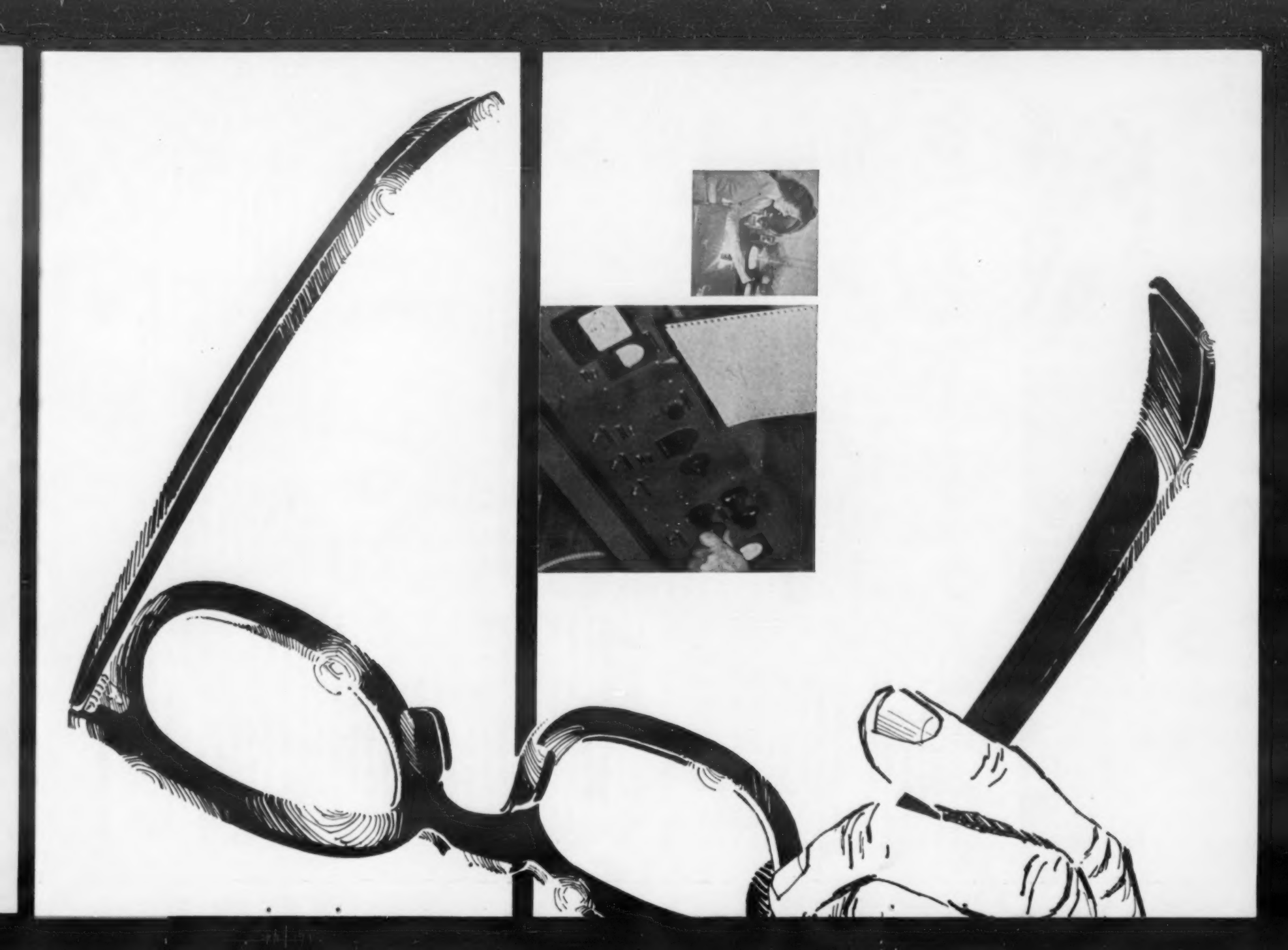
Any tendency of a backing compound to develop H_2S odors can be checked by placing a freshly dried finished sample in a closed jar along with moist lead-acetate indicator. The sample should still be warm from the dryer. Clue to watch: If the lead acetate paper darkens, H_2S vapors are present.

WHERE RESEARCH IS HEADED

The same kind of competition that works against you in many respects is working for you as far as research is concerned. Competition is forcing heavy research in the latex-backing field to find better products at lower prices.

Then, too, research is coming up with intermediates or linkage assistants that will help latex foams bond chemically with fiber so that adhesion will be superior to that provided by mechanical bonding. For an example of another significant development, latex polymerization today makes it possible to provide a suitable foam for certain uses with GRS latex alone.

Fiber finishes on soil-resistant carpeting, are creating the necessity for better adhesion from the backing compound. Scatter rugs, for another example, need more slip resistance—but can't stand a much higher price. Then, in the many new homes with radiant-heating facilities, there's a growing market for backing compounds that will withstand long-term heat ageing. And finally, one big, unreached goal is the need for better adhesion of the backing compound to the synthetic fibers.



"security" clearance

Take all possible care to control the quality of chlorine and caustic up to the point of shipment. Follow proper loading procedures to the letter. Then go one step further . . .

At Wyandotte, this means putting a sample from each tank-car shipment of chlorine or caustic through a battery of exacting tests, as a "security" clearance.

These samples are subjected to qualitative and quantitative analyses. They measure up, or the car doesn't go out.

Few samples fail to clear this final check. The steps that precede it provide virtual assurance of quality. But because the possibility, however remote, exists . . . we feel that the practice is warranted.

Dependable quality is a point of pride at Wyandotte. So is dependable service. Significantly, both of our chlorine-caustic plants are on major waterways to gain the advantage of low-cost water transportation. At Geismar, in the South, we are on the Mississippi . . . and close to the Gulf. At Wyandotte, in the North, we are on the Detroit River, and have direct access to the Great Lakes and the St. Lawrence Seaway. Railways and highways also go out from these two plants to four-fifths of the productive capacity of the U.S. and Canada.

The benefits to users of Wyandotte Chlorine and Wyandotte Caustic in its many forms are plain. We can ship economically and with dispatch . . . by barge or ocean tanker, truck or tank car. May we discuss the possibilities with you? *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

WYANDOTTE CHEMICALS

MICHIGAN ALKALI DIVISION

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CIRCLE 81 ON READER SERVICE CARD

SOME PERFORMANCES HAVE NEVER BEEN EQUALLED—

STANDARD FOR SKYSCRAPERS—Reaching majestically 102 stories and 1,250 feet into the sky, the Empire State Building is the world's tallest. In addition, a 222-foot television antenna towers above the building. Revolving searchlights installed on the 90th floor can be seen 300 miles away. More than 1,000,000 people visit the observation floor annually.

Look at Pine Oil

Someday someone may build a taller building than the Empire State Building —but it hasn't been done yet. And someday someone may invent a better all-round blending ingredient where high solvent performance is required.

Pine oil, of course, adds much more. Its wetting properties, bactericidal properties, and safety are well-known.

Pine oil, which has been in short supply for many years, is now readily available due to increased productive capacity. Look to Hercules for all the pine oil you need.

Just look at Hercules® pine oil's performance as a high-powered solvent:

	Kauri-Butanol Value
Pine Oil	**500+**
Toluol	105
Naphtha, H.A.	95
Turpentine	55
Naphtha, VM&P	34
Mineral Spirits	32
Kerosene	23

When everything is considered, pine oil still remains an outstanding ingredient for many diversified uses.

Pine Chemicals Division, Naval Stores Department

HERCULES POWDER COMPANY

INCORPORATED

900 Market Street, Wilmington 99, Delaware

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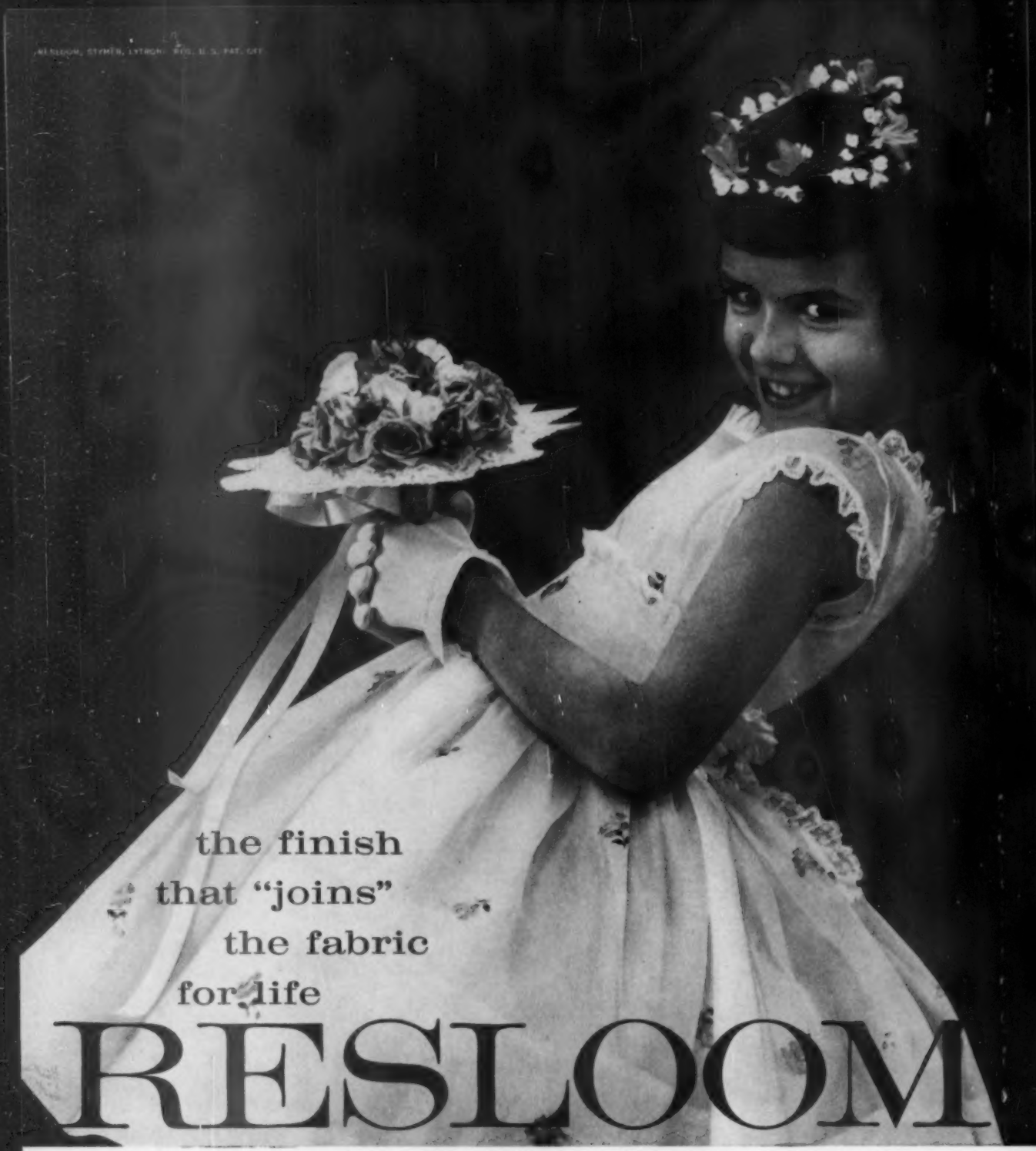
Manufacturers of Textile Finishes, Resins, Softeners, Detergents, Soaps, Oils and Specialties.



M-75 melamine finishes for wash & wear cottons and rayons are smooth, full-bodied. And they last! Even after laundering over and over again in alkaline or acid sour washes. The secret? This highly purified and stable monomeric resin doesn't just coat the fabric—it "joins" it, penetrating right into the fibers, staying there for the life of the fabric. For cottons and viscose, a Resloom M-75 finish means superior wrinkle recovery and excellent dimensional stability. For wools, shrinkage control. For nylon, durable stiffness and structural stability. **Write for technical data,** samples and expert finishing counsel, to Monsanto Chemical Company, Plastics Division, Room 719, Springfield 2, Massachusetts.

MONSANTO DESIGNER IN **PLASTICS**

Monsanto

Other Monsanto finishing agents include: Resloom E-63 chlorine-resistant resin; Resloom E-50 cyclic urea resin; Resloom HP melamine resin; Stymer sizes; AC Catalysts; Lytron polystyrene latices

CIRCLE 84 ON READER SERVICE CARD

DIAMOND CRYSTAL SALT IS YOUR PRODUCT'S BEST FRIEND.

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Of prime importance is the saving realized on dyestuffs when you use Diamond Crystal CMF (Calcium Magnesium Free) Salt. CMF Salt is free of metallic impurities which tend to destroy the usefulness and color portion of the dye. The dye job is cleaner . . . your equipment remains free of contamination . . . down-time for cleaning is practically eliminated.

In addition to CMF, Diamond Crystal Louisiana Rock Salt (from the world famous deposits at Jefferson Island La.) has made possible many consistent and marked product improvements. The key? Diamond Crystal Rock Salt is 99% pure at its source. The inherent purity of both CMF or Rock Salt eliminates costly side reactions.

For immediate service and consultation, for all salt needs (Rock or CMF), call the nearest Diamond Crystal Sales office or write to Diamond Crystal Salt Co., St. Clair, Mich.

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ST. CLAIR, MICHIGAN

Sales Offices: Akron • Atlanta • Boston • Charlotte
Chicago • Detroit • Louisville
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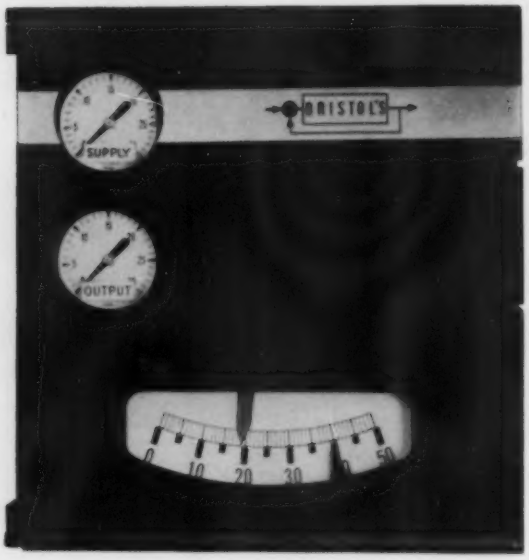
CIRCLE 85 ON READER SERVICE CARD 85

NEW BRISTOL'S



Series 624 A/D* pneumatic controller features simplicity and high control stability

- **Simple modular design for ease of servicing**
- **High control stability for closer process control**
- **Designed for batch-type and continuous processes**
- **Proportional and proportional-plus-reset control models available**

Top control performance with maximum simplicity plus standard Bristol precision measuring elements—those are the key features of the Bristol Series 624 Controller. The 624 uses the same renowned elements that have earned such a reputation for accuracy and dependability on other Bristol automatic controlling and recording instruments—perfected through wide experience and many years of development.

Self-contained modular design of the control unit speeds servicing. The whole modular unit, consisting of an aluminum casting with working parts made of stainless steel, Ni-Span C, and Neoprene diaphragms, can be removed by taking out only two screws and a link.

Outstandingly compact, the aluminum instrument case (only 8" x 8" x 5" overall) is completely weatherproof. It is designed for either flush, surface, panel, or valve mounting. Attachments for pipe mounting (2-inch pipe) are available. Write for complete data on the versatile and economical 624 A/D. The Bristol Company, 103 Bristol Road, Waterbury 20, Conn. 0.38

Advanced Design

CONTROLLERS OFFERED FOR:

PRESSURE AND VACUUM: Ranges from full vacuum to 10,000 psi.

TEMPERATURE: Ranges from —100°F to +1000°F.

FLOW AND DIFFERENTIAL PRESSURE: With mercury-type manometer and dry-type differential unit.

LIQUID LEVEL: With bulb unit and mercury manometer and dry-type differential unit.

HUMIDITY: Zero to 100% relative humidity.

CONTROL UNIT CHARACTERISTICS:

PROPORTIONAL BAND: 0-400% continuously adjustable, direct- or reverse-acting.

RESET: 0.1 to 50 repeats per minute.

AIR PILOT: Non-bleed type.

PILOT CAPACITY: 4.0 scfm.

FREQUENCY RESPONSE: Flat to 400 cycles per minute.

TEMPERATURE STABILITY: Less than 0.1% change in the output pressure for 90°F temperature change.

MATERIAL: Aluminum housing; 316 stainless steel internal parts; Ni-Span C feedback element.

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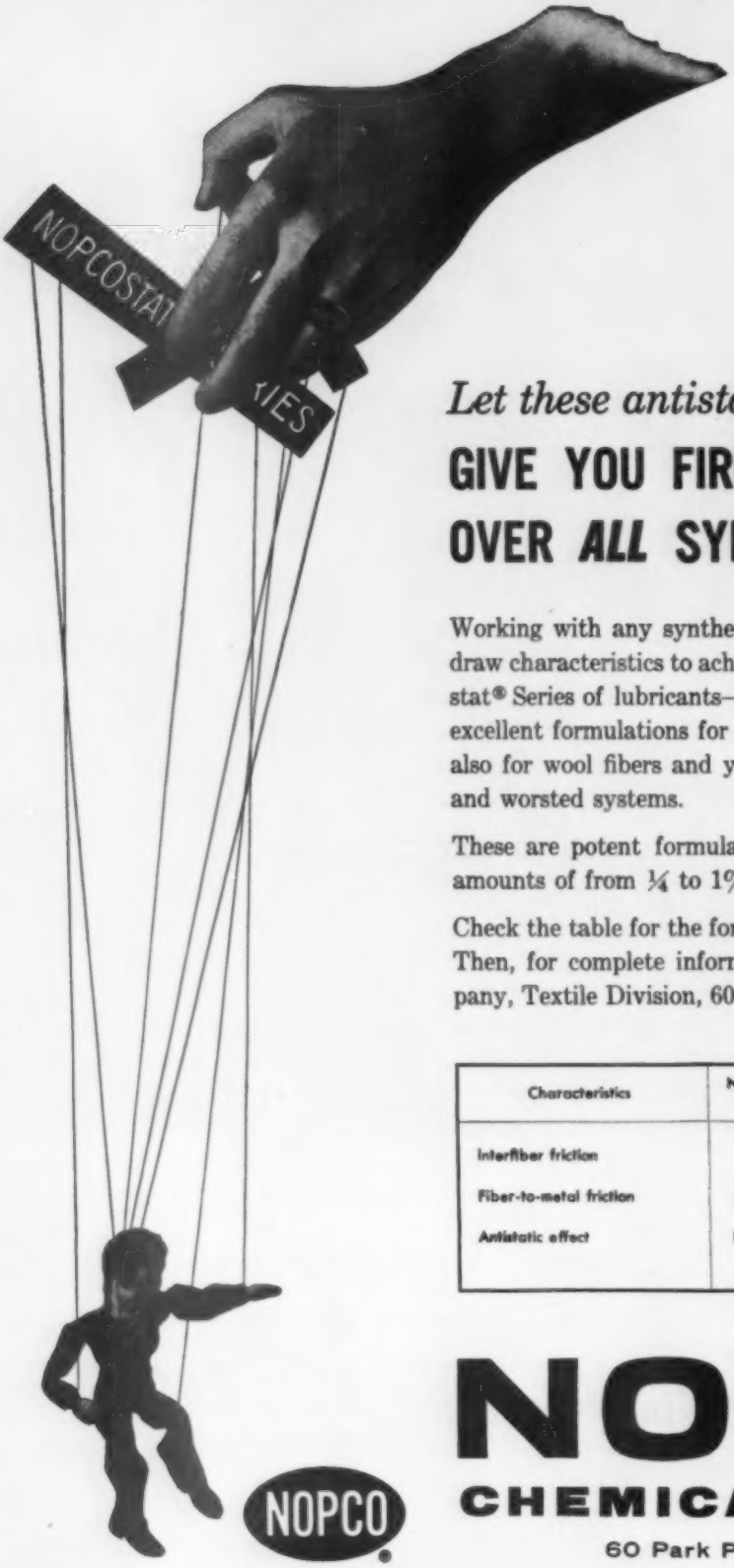

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Working with any synthetic fiber, it is necessary to alter the draw characteristics to achieve balanced processing. The Nopcostat® Series of lubricants—products of Nopco® research—offers excellent formulations for cellulose, polyester and acrylic fibers; also for wool fibers and yarns and yarns processed on woolen and worsted systems.

These are potent formulations, achieving desired results with amounts of from ¼ to 1% owf.

Check the table for the formulation that best meets your needs. Then, for complete information, write Nopco Chemical Company, Textile Division, 60 Park Place, Newark 2, N.J.

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Interfiber friction	Low	Medium	High	High
Fiber-to-metal friction	Medium	Medium	Low	Low
Antistatic effect	Excellent	Excellent	Excellent	Excellent

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Brighten your sales picture with Koppers Dyes that set the mood for selling—developed to compliment every fiber with lasting, fresh color appeal. Today, color-conscious moderns have an educated eye for clean, rich shades with excellent fastness properties. AMACID* and CHROMAVEN* DYES bring out the full beauty of your woolens . . . AMACEL*, LENRA* and AMACRONS*, your synthetics—to help sell the fabrics on sight. These dyes, with excellent dispersibility and fastness properties, assure uniform results that meet every requirement. And don't forget, our *technical service* and complete laboratory facilities are always available. Call or write today.

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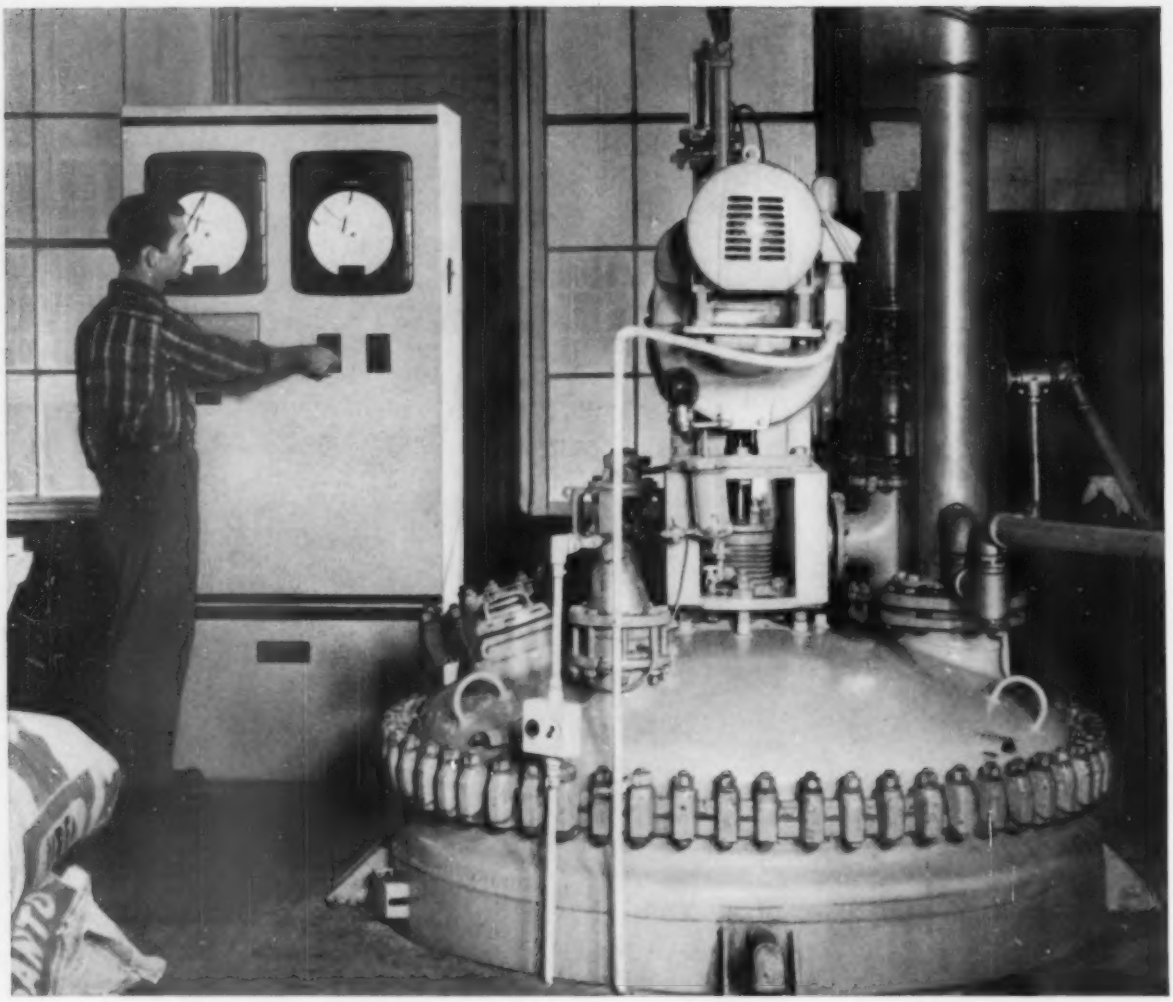
VMA 6703

at Newport Finishing Corp. . . .



These two Foxboro Dynalog Recorders help maintain perfect uniformity of urea-formaldehyde production at Newport Finishing Corp. Two-pen Dynalog at left records reactor pH and temperature, while Dynalog at right logs viscosity. Roy Brown, chief chemist, reports no maintenance has been required since Foxboro Dynalogs were installed April, 1958.

Every batch a perfect match . . . thanks to Foxboro Dynalog* pH and Viscosity Recorders

When you're "batching" urea-formaldehyde resin, continuous analytical measurements are important. Accurate pH recording is essential for the highest quality resin. Viscosity measurements prevent the batch from being ruined — and perhaps the reactor too.

At Newport Finishing Corp., Fall River, Mass., Foxboro Dynalog Recorders provide accurate, continuous records of both these variables, plus reactor temperature. These records tell when corrective action is required — insure perfect repeatability, batch after batch.

Foxboro Dynalog recorders — and controllers, can do the same in your plant . . . and pay for themselves while they do it.

Ask your Foxboro field engineer for details. Or write The Foxboro Company, 846 Neponset Avenue, Foxboro, Massachusetts.

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FOXBORO

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Beauty and color and enduring charm . . . captured in textiles. We stand ready to supply your company with materials of highest quality — from the corn we took off the cob.
STARCHES • DEXTRINES • GUMS
For warp sizing, finishing, printing and dyeing.
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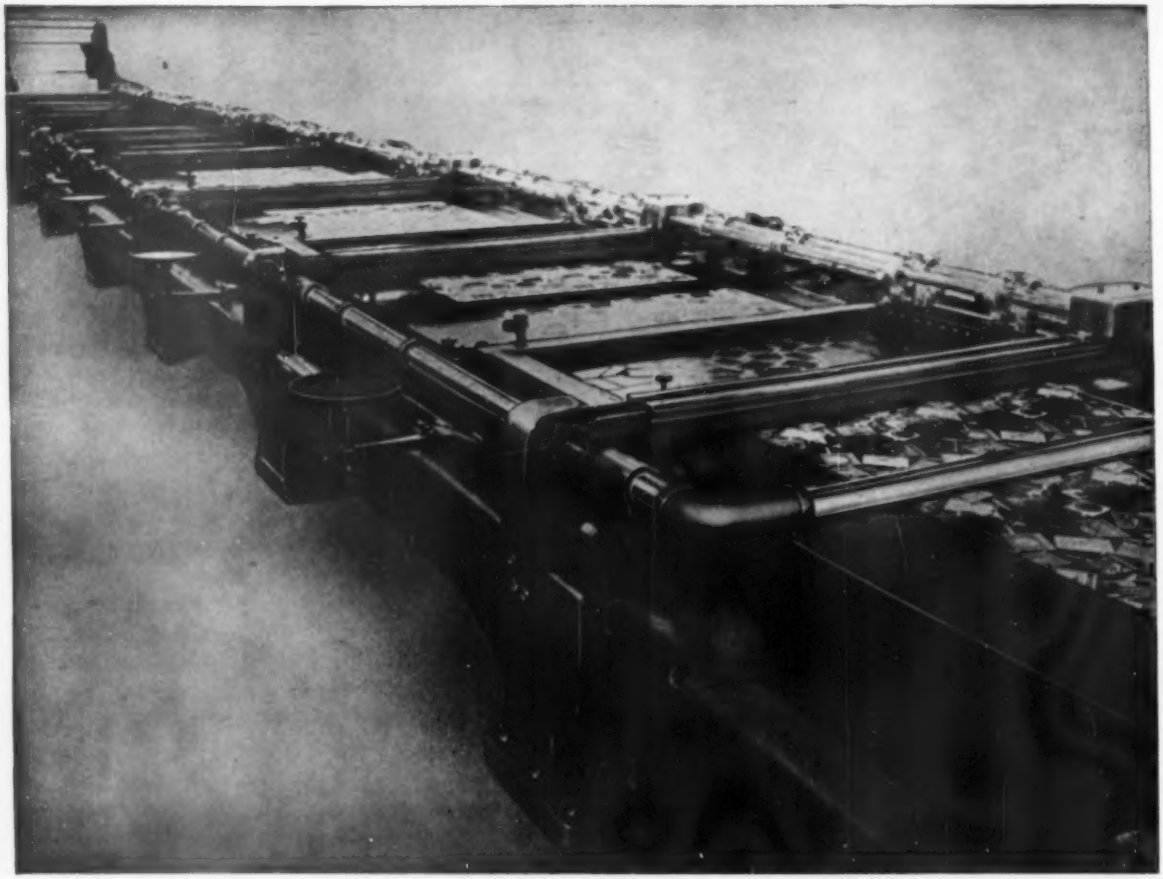

Screen Print up to 12 yds. of Fabric Per Minute with an **ICHINOSE-TYPE** Patented MULTI-COLOR AUTOMATIC SCREEN PRINTING MACHINE

The Ichinose Screen Printing Machine, with more than 60 patented features, screen prints all kinds of fabric perfectly in up to 21 colors at nearly double the speed of other machines on the market. Finished prints are of highest quality, clean, sharp, accurate and far superior to hand or roller prints.

Ichinose means greater economy, too, both in initial cost and in operation and maintenance. It consumes less power, steam, and dye paste, while cutting labor costs to only two operators per machine. Change of design and colors takes less than 30 minutes.

Machines with various different repeats up to 72" and fabric widths up to 60" can be supplied.

To ensure complete satisfaction, all Ichinose machines are installed by our own technicians anywhere in the world. Write today to Dept. TW8 for illustrated catalogue and printed fabric samples.

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Fill your surfactant needs

from CARBIDE'S 9 TERGITOL nonionics

Take your choice from CARBIDE'S TERGITOL nonionics—one that is completely soluble in oil . . . another that dissolves in water at high temperatures . . . or one with a combination of characteristics. TERGITOL nonionics have outstanding capacity to emulsify oils, waxes, and greasy soils—to hold them in suspension. As wetting agents, TERGITOL nonionics are noted for their chemical stability in the presence of acids and salts. They are not affected by hard water or alkalies.

TERGITOL nonionics have proved effective in scouring, bleaching, and carbonizing compounds used by the textile industry. As detergents, they speed dishwashing, laundering, dry cleaning. They give good pigment dispersion, flow-out, and stability to latex paints. Metal cleaners, leather dressings, silicone preparations, shampoos, adhesives, bactericides—all can be improved with TERGITOL nonionics.

Cloud Points of 0.5% aqueous TERGITOL Nonionic Solutions (Degrees C.)

NP-14	Insoluble
NP-27	20
TP-9	51-56
NPX	60-65
NP-35	90-95
NP-40	100
TMN	35-37
XD	60-65
XH	90-100

You can obtain TERGITOL nonionics in 55-gal. drums, combination car load or truck load lots, or compartment tank car shipments. Your CARBIDE Technical Representative can help you solve your surfactant problems. Or write Dept. HC, Union Carbide Chemicals Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y.

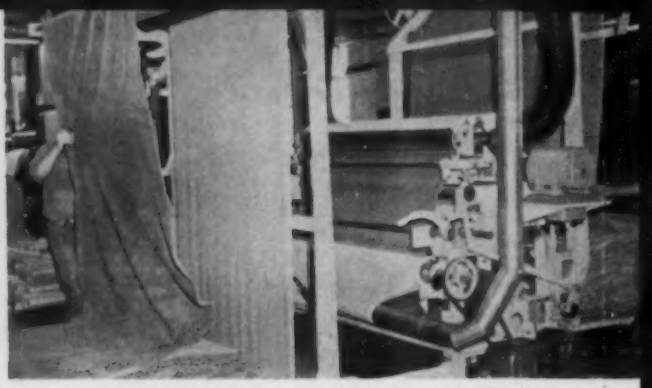
TERGITOL and UNION CARBIDE are registered trade marks.

UNION CARBIDE CHEMICALS COMPANY

UNION CARBIDE

CIRCLE 95 ON READER SERVICE CARD

KEY STEP—Napping. That's what's going on at this new Woonsocket machine with Positive Invariable Speed drives to develop a nap that will average ¼- to ⅜-in. long.



LAST STEP—Shearing. This single-head Parks & Woolson shear evens out the length of pile, emphasizes luster developed in the electro-polishing process.

CHEMICAL TREATMENT & FINISHING

North American Mills, Inc. now turns out high-pile knitted fabrics that look just like expensive woven-pile fabric. It's the story of . . .

A Sideline That Grew Up Fast

HEAVILY-NAPPED KNITTED GOODS have moved up in a hurry at North American Mills, Inc., of Charlotte, N. C.

Such fabrics used to be just a specialty line at North American. But not today. Today they are important profit-producers that owe their success to good looks and low cost. They have many of the characteristics of expensive woven-pile fabrics. But they can be produced far more economically.

North American knits the majority of its line with a cotton back, and a man-made-fiber face—Orlon, nylon, Dacron, or Acrilan, depending on the style.

Production in circular-knitted fabrics is mostly in goods that weigh from 16 to 24 oz. per running yard of 60-in. goods. An all-nylon fabric that get a suede finish runs 11 to 13 oz. per running yard at 54 in. wide.

The goods are dyed as they are knitted. After preliminary drying, they are split in preparation for napping.

All equipment in the finishing department is new. It is designed especially to handle knitted fabrics. North America pays particular attention to suitable let-off and take-up mechanisms so that there isn't any overstretching of the knitted fabrics.

NAPPING BY SPECIAL EQUIPMENT

Napping starts with a breaker run on a Woonsocket napper especially designed for knitted fabrics. In this machine worker rolls are clothed with both hooked and straight wire, and the two types of rolls are mounted alternately around the cylinder. Mill hands carefully control fabric feed and delivery in this operation with an eye toward establishing a base for the finished width.

After the breaker run the goods get a light backing before the napping process continues. A range that includes a kiss-roll coater and a tenter equipped with automatic control of its electrical heating elements does this job.

Fleecy linings for women's footwear get a heavier backing to prevent strike-through of the cement used in making the footwear. Finished fabrics that are to be washed in service get a backing that will stand laundering. The backing is always dried as the goods pass through the tenter at the necessary width.

At the same time, enough heat radiates against the back of the goods to set the man-made-fiber face. Temperatures vary from 300 to 325°F. Exposure time is adjusted to suit the fiber being treated.

DEVELOPING PILE

The backed and heatset goods then go on Woonsocket double-action nappers for development of a long, silky pile.

The number of runs will vary with the goods. Also, machine settings for pile and counter-pile roller energy will differ for each fabric. Normally, it takes from three to five trips through the nappers to tease out enough fiber. The last napping run is made on a Woonsocket single-action napper. Purpose: to line up and straighten the pile and to establish the set or direction in which the pile lies.

POLISHING TO ADD GLOSS

After the nap has been developed to suit the finisher, the goods move through a polishing machine. This unit straightens the pile still more by brushing—plus contact with a heated roll. Static electricity that develops through friction helps to straighten the fibers.

The final process is shearing. The plant has two new Parks & Woolson shears. One is a single-blade unit, the other has two shearing units.

The plant now is producing 1,600 pieces per week on a two-shift basis. It will operate around the clock as soon as North American can round up enough operating and supervisory men.

THE BLEACH THAT WOULDN'T STOP TURNING RED

(Another Diamond Alkali Success Story on Chlorine and Caustic Soda)

One of Diamond's customers was a manufacturer of laundry products and cleaners. He figured he could make his business larger by going into the laundry-bleach business.

After some investigation, he assembled equipment, ordered chlorine and caustic soda, and ran his first batch. It turned red, as did every other batch he ran.

A Diamond technical man was called in to run down the trouble . . . traced it to scale in a used heat exchanger. He showed the plant staff how to prepare equipment for handling caustic soda and chlorine, suggested improvements in their setup, helped get the process running smoothly.

If *you* use caustic soda, get to know the Diamond technical man. He not only saves customers money on shipping and handling problems, but he also helps with their process problems. What he can't handle himself, he'll refer to the Diamond Research Center.

There is no finer caustic soda than Diamond's. There is no better service than Diamond's. No matter where your plant is located, you can get fast, economical delivery from one of Diamond's four strategically located producing plants. By truckloads, carloads or bargeloads.

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Diamond Chemicals

CIRCLE 97 ON READER SERVICE CARD

Reactive Dyes Come of Age

By A. J. HALL, Bsc., F.R.I.C., F.T.I., F.S.D.C.
Consulting Chemist, Somerset, England

DYERS TODAY HAVE A NEW TOOL. With it, they can produce faster, more level dyeings. The new tool: reactive dyes.

These reactive dyes are used in dyeing polyamide fibers. (A typical reactive dye—a red one—appears in the formula above.) Properly used, they eliminate the major problems associated with disperse dyes and acid dyes by overcoming two basic problems:

- **Disperse dyes on nylon are not always washfast.** Yet, as every dyer knows, they are so well absorbed by nylon 6 and nylon 6,6 that it's no trouble to produce almost any shade you want. What's more, they give little or no trouble with levelness, even when there are mechanical variations within the nylon itself.
- **Acid dyes tend to build up poorly on nylon and to dye unevelly.** Yet they're washfast on nylon.

Now reactive dyes promise to solve these problems. Already there are a number of them that work satisfactorily with nylon. Granted, the range just now is limited to scarlet, orange, yellow, and blue. But other dyes are sure to follow.

PROBLEM: LOOSE LINKAGE

The dyeing theory of disperse dyes and nylon is based on the rather loose attachment of the disperse dye to the amide groups along the nylon-molecule chain. There are many of these groups, which is the reason for the high absorption of disperse dyes by nylon. But the linkage of disperse dye and nylon's amide group is not strong, and therefore the washfastness of disperse dyeings is not too good.

With acid dyes, the linkage is primarily with the considerably fewer amino groups at the ends of the nylon molecules. The bond is strong. That means washfastness is good—but the scarcity of suitable dye sites brings up the familiar problems of blocking and unlevelness.

If acid dyes are applied to nylon at pH 3 to 5, 15 to 30 mg. of commercial dye can be absorbed per kilogram of nylon—hardly enough to produce deep shades. In contrast, nylon will absorb about 1,000 times more disperse dye than acid dye under similar conditions. Today, the numerous amide groups in nylon cannot be made available as dye sites for acid dyes without working at dangerously low pH of 1 to 3.

The bond formed by the acid dyes with the amino groups in nylon is apparently stronger than that formed with wool. Therefore nylon-acid dye combinations are very fast to washing.

The reactive principle of chemical combination of dye and fiber is applicable to nylon. The Procinyl series of dyes are reactive to nylon and are based on water-insoluble dyes that contain a mono-halogen-1:3:5-triazinyl-2-amino group. The dyes are applied in disperse form, in a slightly acid bath, and are absorbed in the same way as ordinary disperse dyes.

The active chlorine group can then be induced to combine with the amino and amide groups of the nylon when the bath is made alkaline.

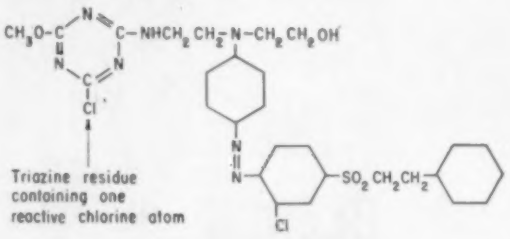
The dyes are similar to the Procion types but do not carry the water-solubilizing sulfonic-acid group.

The Procinyl dyes can react with water just as the Procion dyes do. But the reaction product is still an insoluble disperse dye. It has some dyeing power, and it resists washing out.

This by-product coloration is usually as fast to washing as many conventional disperse dyes. But formation of their uncombined dye is discouraged by dyeing the nylon at pH 3.5 to 4.0

HOW THE DYES ARE APPLIED

Look at the dye structure below.



The red dye. It's applied as follows:

First, one part of dye is dispersed in water with the aid of a dispersing agent such as Aerosol, or a sulfonated naphthalene-formaldehyde condensate. The dispersion can be added to the dyebath, which should be set with 1 part of an ethylene oxide-fatty alcohol condensate per 1,000 parts of dyebath.

In a 4,000-liter dyebath 200 lb. of nylon can be treated. The temperature is raised to 95° C. and held for 1 hr., after which the goods are rinsed. Chemical combination of the dye with the nylon is induced by a hot soaping with 0.1% soap and 0.1% soda ash on the weight of the goods.

Prints can be made with the Procinyl dyes by making a print paste of this general type:

10 parts of 7.5% paste of the dye.
32 parts of cold water.
2 parts of aqueous emulsion of sperm and pine oil.
1 part of sodium salt of meta-nitrobenzene sulfonic acid.
5 parts of 50% ethyl alcohol.
50 parts of Nalfa Crystal Gum.

The paste is roller-printed on the fabric, which is dried and then steamed for 30 min. The goods are rinsed in water at 25° C. and further treated in a 0.2% soap liquor at 60° C. Rinsing and drying follow.

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For the MICROROK catalog page containing complete technical information, see your S-W Sales Engineer.

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Ask the man from S-W . . .

. . . about the excellent wear-resistance qualities of **MICROROK** covers. Heat resistance this cover offers, too, up to 180°F. Padder, Mangle, Washer, and Carbonizer Rolls give long service life when their covers are **MICROROK.**

Literally hundreds of **MICROROK** Rolls are proving daily that they are the most versatile hard rolls in use today. This and other factors mean cover longevity which you may not be getting. Ask your S-W man for the facts.

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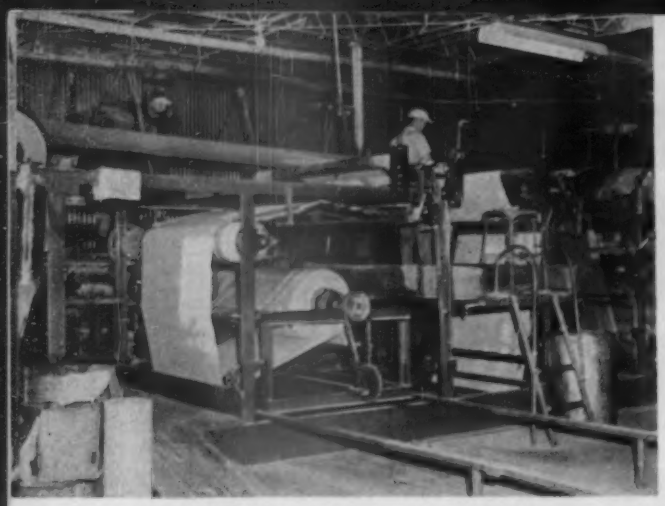

TREATING AND COOLING both sides in one run is the job of this machine (built of stock channel steel). Goods are loaded on carriage at center by power hoist. Carriage moves out on tracks (foreground) to receive its load.

KEY OPERATION takes place here, where hot waterproofing material from floor-level tanks is pumped to goods as they pass under knife. Coat 1 goes on at left. Coat 2 (back of fabric) goes on at right, after fabric passes over cooling can.

CHEMICAL TREATMENT & FINISHING

Waterproofing in Just One Step

THEY'VE GOT THEMSELVES a one-step waterproof and mildewproof process at Brown & Brown, Inc. (Mobile, Ala.). It can belt out 100,000 yd. of cotton goods a week. Key to the system: a pair of machines (photos above) that speeds the fabric on its way.

Other high spots in the Brown & Brown set-up:

- Minimum handling.
- Almost no material wastage.
- Thorough impregnation in just one run.

Brown & Brown works on canvas, duck, jeans, sheeting, and other cotton fabrics. Its operation is basically a standard knife-coating process—but there are at least two important differences:

1. Formulations of waterproofing and mildewproofing are 100% active material. There's no water, no solvent in the formula. Therefore there's no need for the usual drying equipment that drives off volatile materials in conventional fabric-coating operations.

2. There are no oxidizable ingredients in the formula. That eliminates the time it usually takes to finish the reactions that go in linseed-oil type compounds.

TWO COATS, ONE RUN

Goods received at the plant are made up into large rolls that vary in yardage according to the weight of the fabrics.

The goods are led under tension to the first coating point and passed under a knife blade mounted between two guide rolls. The knife blade is mounted so that the cloth depresses into a V shape between the two guide rolls.

The combination of waterproofing and mildewproofing materials, heated to 180°F., is fed into the V-shaped depression ahead of the knife blade. The hot mixture saturates the fabric, and the blade scrapes off excess material. The cloth then travels over a cooling can that is supplied with chilled water.

The goods return under the machine and get a similar coating on the reverse side, cooled as before, and batched up. The goods now are ready for fabrication for such uses as truck tarpaulins, boat covers, tents and awnings.

TWO-COLOR EFFECTS, TOO

Careful adjustment of the formula temperature and the pressures exerted at the knife blade make it possible to get good saturation of the fabric without strike-through. Then, by using different mineral pigments in the waterproofing mix, Brown & Brown can produce fabrics colored differently on each side.

OIL FOR HEAT TRANSFER

To stay fluid, the waterproofing mixture has to be heated several degrees above the melting point of some of the waxes used in the formula.

Some time back the plant switched from steam to hot oil as a heat-transfer medium. An oil-burning hot-water boiler of a type similar to home-heating equipment was installed to do the job. The boiler, its piping, and the jackets around the formula kettles now are filled with a Shell Oil Co. oil designed expressly for heat transfer.

Says company President Samuel Brown: "The hot oil system beats steam for our purposes in several ways. We have no high pressure, and no corrosion. And we lose practically no heating oil. We add a little oil from time to time to make up for the small leaks that occur around the circulating pump. That's all."

MAIN INSTRUMENT PANEL at Russell Manufacturing Company has instruments to record and control steam flow, water temperature, "J" box temperature, steam pressure and washer water flow.

Russell Manufacturing Company runs cloth faster, saves steam and water, with new Honeywell-controlled bleach range.

Russell Manufacturing Company of Alexander City, Alabama has combined rope and open width bleaching in a fully controlled range. Honeywell designed the automatic control system which not only permits cloth to run at speeds up to 200 yards per minute, but also has greatly reduced steam and hot water consumption.

One master recording-controller positions a three-way mixing valve to maintain water temperature at the same pre-set level in all three washers. No water is wasted. It's metered in exact amounts for proper processing and shuts off automatically after five minutes of range downtime. This saves an estimated 1,250 gallons of hot water alone every time the process is shut down.

Through the combination of open width in "J" boxes, desizer, and padders and rope form in the washers, Russell saved $33,000 in equipment and installation costs and 35 feet of floor space.

In your own mill, automatic control can upgrade product quality and bring new economy and efficiency to any process. Your nearby Honeywell field engineer can tell you how. Call him today . . . he's as near as your phone.

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CIRCLE 101 ON READER SERVICE CARD 101

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VARI-BOW® and FIXED BOW

ELIMINATE ▶ WRINKLES, LOSS of WIDTH, DISTORTION

No need to "suffer-through" frequent periods of downtime in a vain attempt to correct processing problems.

You can literally smooth out your runs — your fabrics — by installing Mount Hope Free-Wheeling Expanders. These mill proven, corrective devices automatically protect cloth — smooth out wrinkles, keep it distortion-free, held at full width.

Mount Hope Free-Wheeling Expanders have many applications — are equally efficient whether used for the most delicate fabrics or heaviest materials. It takes but a moment to complete the coupon below. It could well prove a most profitable first step toward final solution to your problems. Why not do it today?

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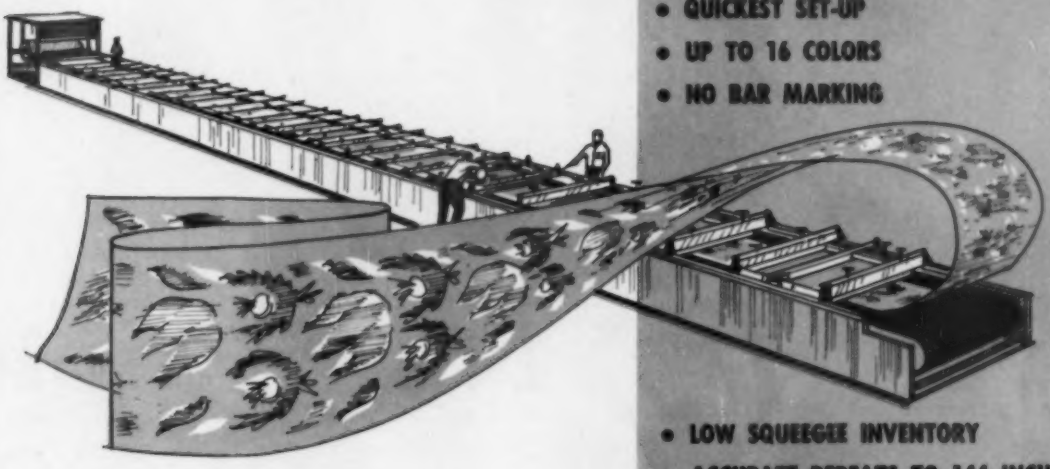

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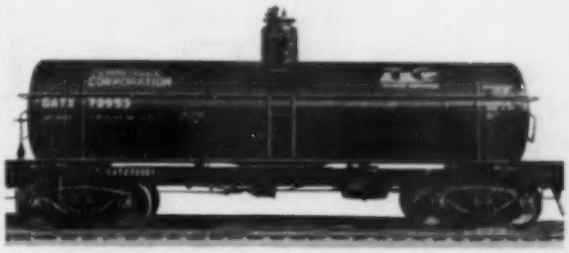

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CIRCLE 103 ON READER SERVICE CARD

Du Pont's New Rapid Bleach Process Cuts Bleaching Costs... Improves Dyeing Quality

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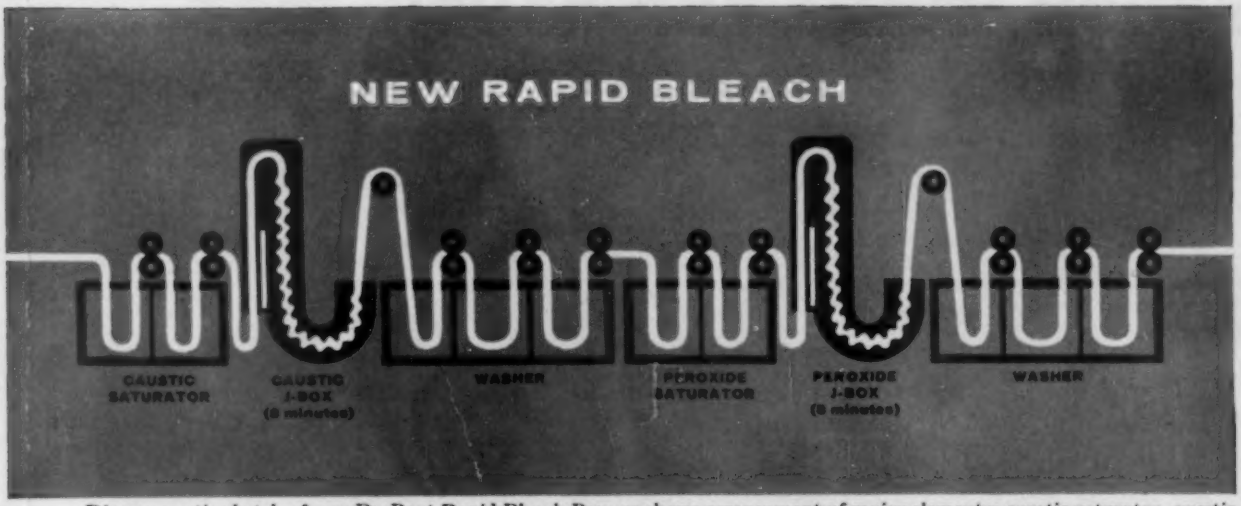

Diagrammatic sketch of new Du Pont Rapid Bleach Process shows arrangement of major elements: caustic saturator, caustic J-box, washer, peroxide saturator, peroxide J-box and final washer. Operation saves time, cuts operating costs. It can be used for medium-weight cotton fabrics and is especially suitable for hard-to-handle heavyweight fabrics that are susceptible to bruising.

Production-scale operations prove the superiority of the Du Pont Rapid Bleach Process over conventional methods for preparing heavy cotton fabrics for dyeing and finishing . . . at a lower cost.

The new Du Pont Process (shown above) prepares fabrics for finishing with high absorbency and exceptionally good dye receptivity. You obtain high color values and much greater clarity from the dye colors used. And you do it faster and easier.

Du Pont Rapid Bleach is a continuous process . . . specifically designed for medium to heavyweight fabrics. It's unique, simple and fast. Has caustic pre-treatment in the first J-box. The new two-stage process reduces cloth storage time to as little as 8 minutes in each J-box. Makes substantial savings possible over batch methods.

This new method introduces an open-width, continuous process designed for the preparation of sensitive fabrics (such as twills, drills, poplins, etc.) for dyeing. It reduces seconds and rejects due to bruises, rub marks and creases and can be readily adapted to any continuous, or semi-continuous, open-width system.

If you'd like more information on new Rapid Bleach, call your Du Pont Representative. He's a specialist in textile bleaching and will be glad to show you how this new process may profitably fit into your mill.

DU PONT BLEACHING PRODUCTS

assure you of the best bleaching results every time. They help speed bleaching operations more economically. They're thoroughly tested and proved out in successful mill operation. All are readily available from convenient shipping points to assure prompt delivery. Du Pont, Electrochemicals Department, Peroxygen Products Division, Wilmington 98, Delaware.

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...CONVEYOR BELTS, for example

In mines and quarries—and wherever heavy duty performance is essential—conveyor belts fabricated of high-strength Golden Caprolan nylon are superb.

An achievement of Allied Chemical, Golden Caprolan possesses a remarkable combination of superior performance qualities for beltings, including excellent rubber adhesion, unsurpassed resistance to abrasion, greater resistance to flex fatigue as well as troughing qualities not obtained from other yarns.

Golden Caprolan nylon set a new standard in heat stability for tire yarn. Also, Golden Caprolan set new standards of performance for heavy duty marine ropes and is enjoying increasing use in yachting ropes, tarpaulin fabrics, high-strength webbings and dozens of other industrial applications.

If you have a tough job, we have the tough yarn for it. If you wish to improve an existing product, or create one, let us help you with Golden Caprolan or with our wide range of deniers in Caprolan nylon heavy yarns.

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Allied Chemical

Fiber Marketing Dept., 261 Madison Ave., New York 16, N.Y.

What's new this month in . . .

Fibers, Yarns, and Fabrics

New Fiber Process

A new process for producing superfine fibers is being offered by American Viscose Corp., developer of the patented method.

In the new process organic plastics—such as vinyl, acrylic, nylon, and polyester resins, as well as amorphous materials—are melted or dissolved in volatile solvents and then sprayed into an air stream to form superfine fibers. These fibers can be mixed with other fibers during the spraying and the mixture deposited on a moving belt in random distribution as in a web.

The new process has been licensed by Mine Safety Appliance Corp. for the production of filters for respiratory and space filtration. Other possible uses, according to American Viscose, are in nonwoven fabrics and insulation layers for sleeping bags and winter clothing.

Black Kodel Fiber

Eastman Chemical Products, Inc., has introduced a solution-dyed black Kodel polyester fiber.

The new fiber is now being produced in 2.25, 3, and 4.5 per-denier-filament staple, plus staple, at $1.79/lb. It will be available for spring 1961 fabric blends. End product: men's and women's apparel.

Indian Head's Blend

Indian Head Mills, Inc., recently introduced two blended fabrics. One is a Dacron-cotton fabric, the other an Arnel-cotton blend. They will be merchandised under the Indian Head brand name.

The Dacron-cotton blend—of 65% Dacron and 35% cotton in both warp and filling—is a lightweight drip-dry fabric with a linen-like look. This blend is available in 14 colors at a suggested retail price of $2.49/yd.

The Arnel-cotton blend—containing better than 50% Arnel—is of suiting weight and is woven in cross-dyed plaids and checks. Suggested retail price is $1.49/yd.

Polypropylene Felts

American Felt Co. has added polypropylene felts to its line of man-made-fiber felts, which carry the Feutron trademark. The company is making the new felts at its Westerly, R. I., plant.

The new felts are expected to increase the range of application of Feutron filter media for both liquid and dry filtration, R. Power Fraser, general sales manager for the company, said.

Variation of Velcro

Velcro Corp. has introduced a variation of its nylon tape fastener for use in the electronics and electrical industries. The new product is called Back-to-Back Velcro.

It consists of a single strip of nylon tape faced on one side with tiny hooks and on the other side with soft loops. The single strip of tape can be fastened together upon itself. The electronics and electrical industries are using this tape as a harnessing device for wires that have to be held together in separate groups. The tape is looped around the wires and closed.

Back-to-Back Velcro is available in ½-or 1-in. widths and comes in 14 standard colors.

New Fall Blends

Exclusive Fabrics, Inc., and Earl-Loom Fabrics, Inc., have introduced new blended fabrics for fall.

Exclusive Fabrics' group (called Rondolay) of 50-50 Creslan-wool blends is shown in yarn-dyed patterns of large and small plaids, stripes, and checks. The group of fabrics will be seen this fall in separates, suits, dresses, and pants.

Some of the patterns are available in 8-oz. dress weight, others in a 10½-oz. sportswear weight. All the fabrics have a flannel worsted-type finish with a soft hand.

Earl Loom's fabrics called Swing-a-ling are blends of Creslan and rayon.

They feature muted plaids, madras effects, and district checks. The district checks are available in 47 different color combinations.

Extra-White Nylon

Ansonia Mills, United Elastic Corp., and J. W. Wood Elastic Web Co. are three of the mills that are using American Enka's new extra-white filament nylon yarn called Blanc de Blancs.

The new yarn was expressly developed by American Enka for foundation garments and other apparel fabric applications. The yarn is available in a variety of deniers.

Two All-Wool Carpets

Roxbury Carpet Co. has introduced two new all-wool carpets.

Idlewild is the newest addition to the company's Jac-Tuft collection. This tufted carpet has varied pile heights, which create a random pattern.

Tribunal is an all-wool wilton with a thick, looped pile. The pile in this carpet, as in Idlewild, has varied heights.

Both carpets have dual-jute backings. They are available in 12- and 15-ft. widths and retail for about $8.95/sq. yd.

Some things just lie there...

Some items just lie on the shelf, eating up overhead. Murdering you...You make your money on merchandise that moves. Du Pont fibers help goods do exactly that: move!...Du Pont fiber trademarks are known, trusted, proven. They're miles ahead in consumer preference. (Fact: 6 to 1, consumers in a recent survey said they'd prefer to have Du Pont make the fiber in women's slips.) ...And Du Pont keeps building this preference through a broad advertising program, including "THE DU PONT SHOW WITH JUNE ALLYSON"...Yes, it makes sense to feature the fibers that help you move goods: DuPont fibers!

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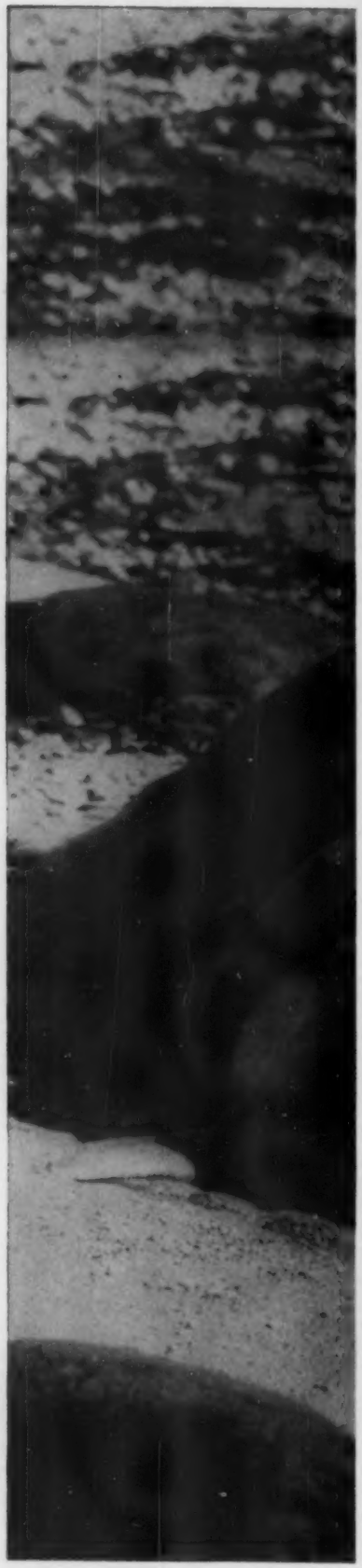
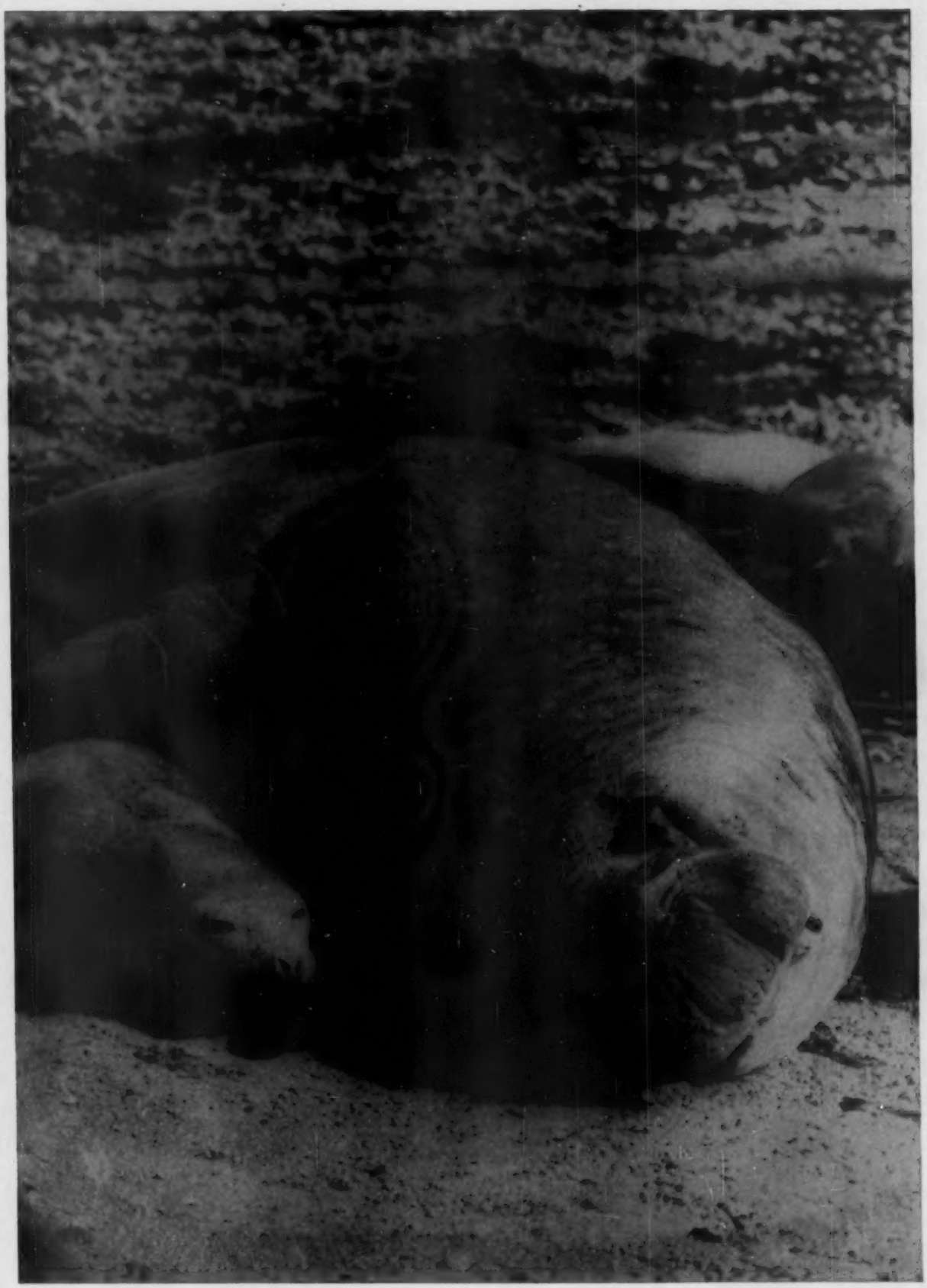
*Du Pont's registered trademark for its acrylic fiber. **Du Pont's registered trademark for its polyester fiber.

Enjoy THE DU PONT SHOW WITH JUNE ALLYSON, Monday nights on CBS-TV.





get to know the facts about

Creslan®

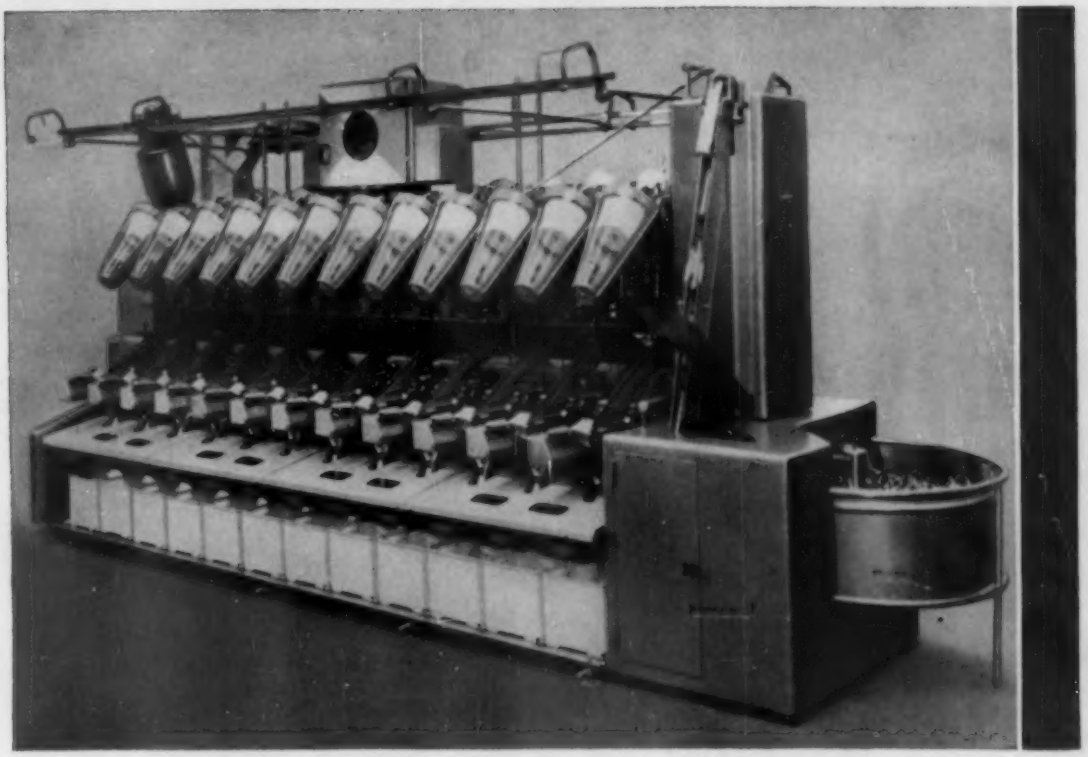
ACRYLIC FIBER

The Most Modern of the Acrylic Fibers

Creslan acrylic fiber has already made an auspicious entry into spinning mills and weaving plants. You will be interested in knowing more about this versatile fiber. Its qualifications are specific—and numerous. For a full description of these qualities and properties, write for your copy of our TECHNICAL DATA BULLETIN.

Creslan acrylic fiber is a product of American Cyanamid Company, Fibers Division, 111 West 40th Street, New York 18, New York.

CYANAMID



SCHWEITER Automatic Filling Winder with the new parallel bobbin arrangement for the filling of all types of loom batteries

Our latest model
Automatic Filling Winder,
type MSL:

- with Dust Exhaust system
- with Parallel Bobbin arrangement– regular, or double size, boxes can be used
- equipped with ROTOR – for building Tailless Bobbins
- with, or without, Interlocking Tip Bunch for Automatic Loom Box loading

SCHWEITER LTD.
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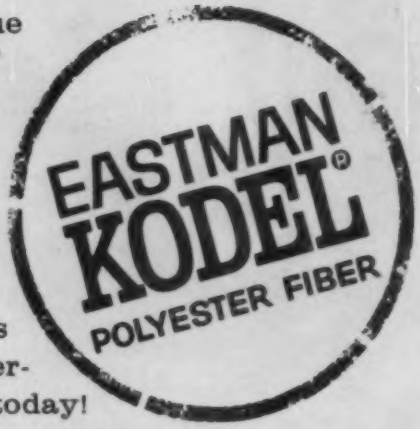
Manufactured by **WHITIN MACHINE WORKS**, *Whitinsville, Mass., (U. S. A.) for sale in U. S. A. and Canada*
Manufactured by **SCHWEITER** *for sale in other countries*

CIRCLE 111 ON READER SERVICE CARD 111

.....new EASTMAN breakthrough

SOLUTION-DYED BLACK KODEL POLYESTER

Now you can get a polyester fiber in a true colorfast black! Kodel, the champion of stay-fresh fibers, is first in America with this important new fiber development. A breakthrough that means new styling possibilities for polyester blends... more dimension, more colors, more pattern effects. Complete color uniformity in your blacks, too. Eastman's new Kodel black is now being produced in 2.25, 3 and 4 denier-per-filament staple ... also tow. Look into it today!



Kodel is the trademark for Eastman polyester fiber

EASTMAN CHEMICAL PRODUCTS, INC., SUBSIDIARY OF EASTMAN KODAK COMPANY, 260 MADISON AVENUE, NEW YORK 16

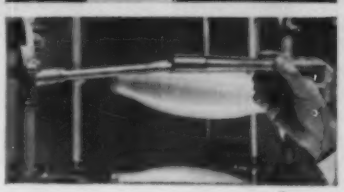
A KIDDE CREEL can handle any package...

present-day or future development!

Talk about versatility! Kidde creels are designed to handle any package—any size, any shape—simply by using adapters like those in the pictures at right. Clamp type construction makes it easy to change vertical or horizontal spacing to accommodate different sizes and shapes. And Kidde will design holders and adapters for present creels to take any future packages developed!

Kidde works with you to build the creel your operation requires—horizontal or vertical, magazine or non-magazine—any size from 40 to 4,000 running ends. And Kidde tension devices can handle the entire range of yarns—natural or synthetic, filament or spun.

Why not send for our booklet describing all the advantages of Kidde creels. Just write or phone.



TRICOT AND RASCHEL MACHINES • TRICOT WARPERS • HORIZONTAL WARPERS • BEAMERS
CREELS • SLASHERS • WINDER-REDRAWS • TENSOMETERS • TENSION COMPENSATORS

Kidde

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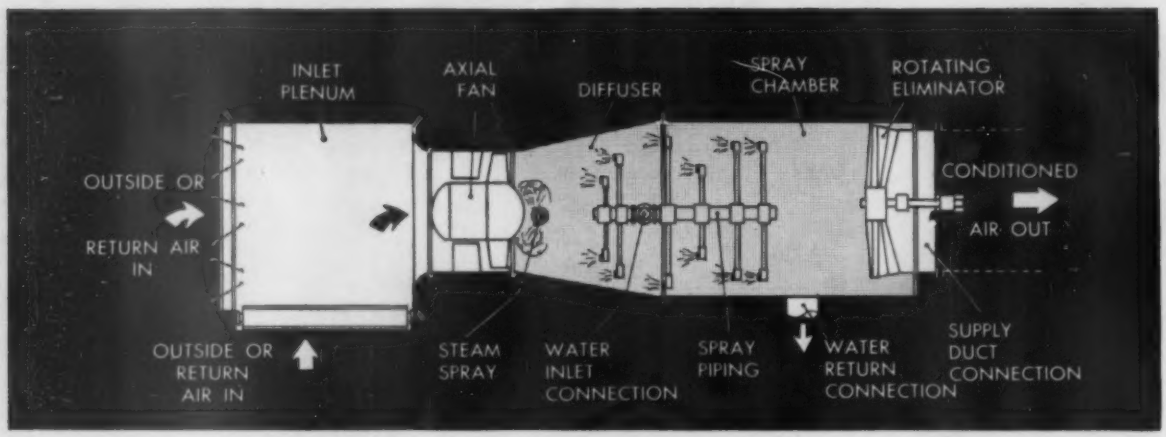
The word KIDDE is the trademark of Walter Kidde & Company, Inc., and its affiliated companies.

CIRCLE 113 ON READER SERVICE CARD

NO AIR FILTERS?
NO AIR FILTERS!

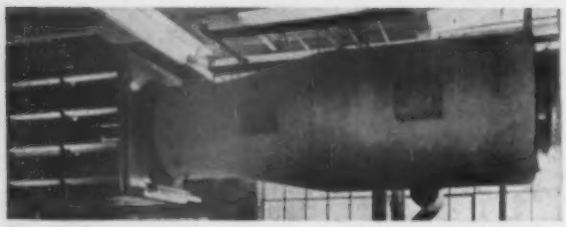
This Carrier Rotaspray Air Conditioner is self-cleaning!



Rotaspray units are self-cleaning and require no filters. Instead of trying to keep lint and coarse particles out as conventional systems do, the Carrier unit lets them enter, separates them from the air and returns them to a central point for automatic collection disposal.

As important as the self-cleaning feature is, it's only one of many ways the Carrier Rotaspray Weathermaker System* has proved itself vastly superior to conventional close-control air conditioning systems. For example:

UNITARY DESIGN. Instead of one large conventional central station system serving several departments, each department has its own Rotaspray unit and can change its temperature and humidity to meet its individual needs.



Carrier Rotaspray Weathermaker units may be installed rooftop mounted, ceiling suspended or outside wall mounted.

SMALLER APPARATUS SIZE. A Rotaspray unit requires less than 1/3 the space of a conventional system of equal capacity.

ELIMINATES MANY SYSTEM COMPONENTS. Units require no water strainer, water pump, water tanks, city water or drain piping. No apparatus room and no floor drains needed.

BETTER HUMIDITY AND TEMPERATURE CONTROL. Eliminates dew point control and its problems. Within Rotaspray System capacity, departments simply "dial" the temperature and humidity required.

In all, there are 17 reasons why it's well worth your while to look into the Carrier Rotaspray System for your mill. They range from lower installation costs to superior efficiency and substantial savings in operation and maintenance. For information, write Machinery and Systems Division, Carrier Corporation, Syracuse 1, New York.

*Reg. U.S. Pat. Off.

BETTER AIR CONDITIONING FOR EVERYBODY EVERYWHERE

Carrier

Recent Economic Growth — The Numbers Game

If it truly portrayed recent rates of economic growth in the United States, the report on employment, growth and price levels recently issued by the staff of the Joint (Congressional) Economic Committee would point up scarcely less than a national disaster. Among other things, it would document impressively Premier Khrushchev's crack that "the capitalist steed the United States is riding . . . is worn out."

One of the major findings of the Joint Committee's staff (in the Eckstein Report, named for its staff director Otto Eckstein) is that between 1953 and 1959 the average rate of growth of physical output in the United States was only 2.4 per cent per year. This is scarcely more than half the average annual rate of growth of 4.6 per cent the staff found to have prevailed between 1947 and 1953.

Happily, however, the report does not reflect the basic economic realities. Its finding on relative rates of economic growth for the two periods is a statistical *tour de force* which, by the selection of certain figures and certain dates, distorts the record of America's long-term economic growth.

Playing The Numbers Game

By the selection of appropriate starting and terminal periods it is possible to document almost any rate of economic growth that is desired. The table at the bottom of this page shows you how this can be done. It will also show you how the Eckstein staff worked out its shocking contrast in growth rates. The table is built like a schedule of airplane fares between different cities. The postwar years 1946 through 1959 are put down on two axes. One runs down the left hand column, the other runs across the top of the table. Put your finger on the point where the two axes intersect and you have the average rate of growth for the period covered.

ANNUAL AVERAGE GROWTH RATES OF THE U.S. ECONOMY, 1946-1959*

(Percent increases, starting year to terminal year, of GNP in 1954 dollars).

Starting Year \ Terminal Year	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
1946	X	-0.1	-1.9	-1.2	3.0	3.9	3.8	3.9	3.2	3.7	3.6	3.4	2.9	3.2
1947	X	X	3.8	1.8	4.1	4.9	4.6	4.6	3.7	4.2	4.0	3.8	3.2	3.5
1948	X	X	X	-0.1	4.2	5.3	4.8	4.7	3.6	4.3	4.0	3.8	3.1	3.4
1949	X	X	X	X	8.7	8.1	6.5	6.0	4.4	5.0	4.6	4.2	3.5	3.8
1950	X	X	X	X	X	7.4	5.4	5.1	3.4	4.3	3.9	3.6	2.9	3.3
1951	X	X	X	X	X	X	3.4	3.9	2.0	3.5	3.2	3.0	2.2	2.8
1952	X	X	X	X	X	X	X	4.4	1.3	3.6	3.2	2.9	2.0	2.6
1953	X	X	X	X	X	X	X	X	-1.6	3.2	2.8	2.6	1.6	2.4
1954	X	X	X	X	X	X	X	X	X	8.1	5.1	4.0	2.4	3.2
1955	X	X	X	X	X	X	X	X	X	X	2.1	2.0	0.5	2.0
1956	X	X	X	X	X	X	X	X	X	X	X	1.8	-0.2	2.0
1957	X	X	X	X	X	X	X	X	X	X	X	X	-2.3	2.0
1958	X	X	X	X	X	X	X	X	X	X	X	X	X	7.0
1959														

*Compound rates of growth

Following this procedure, you can find growth rates ranging all the way from —2.3 per cent, between 1957 and 1958, to +8.7 per cent, between 1949 and 1950, along with almost any other rate you would choose for various years and sequences of several years over the postwar period.

For example, if you want to demonstrate that the postwar growth rate through 1953 was less than 4% per year, you take off from 1946, include a drop of 0.1 per cent between 1946 and 1947, and come up with a growth rate for the 1946-1953 period of 3.9 per cent. But if you want to show it was quite high, you take off a year later, from 1947 (which drops out that dismal —0.1 per cent for 1947) and come up with a fine growth rate of 4.6 per cent for the 1947-1953 years.

Statistical Hocus-Pocus

That's what the Eckstein staff did. It took off at one end from a year when there was just about no growth, went to the Korean War boom year of 1953 at the other end, and got that average growth rate of 4.6 per cent. Then it took off from the Korean War boom year of 1953 and ran to the year 1959, when business was recovering from a recession and suffered through a steel strike of 116 days, to come up with its 2.4 per cent growth rate for the second postwar period. As the table indicates, by taking off a year later (1954) the average growth rate would have become 3.2 per cent, and if the take off had been 1949 it would have been 3.8 per cent.

There are those who, in nontechnical terms, would characterize this as statistical hocus-pocus. There are also those who would see in it an element of political hocus-pocus, too. This is because the years 1947-53, when the Eckstein staff found there had been the healthy 4.6 per cent growth rate, were roughly years when we had a Democratic president, while the anemic growth rate of 2.4 per cent it calculated for the subsequent years was for years of a Republican presidency.

Actually it can be shown that the civilian part of our economy has had more rapid growth during the Republican administration than it had during the Democratic years. If military expenditures are subtracted from the national ouput, the resulting growth rate for 1953 to 1959 is slightly higher than for 1947 to 1953.

However, we do not question the *bona fides* of the Eckstein staff. **But we do assert that it has produced a statistical picture of the postwar growth of the American economy which is dangerously misleading both at home and abroad.**

Abroad, the report appears to give official documentation to the propaganda line that the Soviet economy is running rings around the U.S. economy in growth, and that it is Communism a country should choose if it really wants to develop rapidly. Building on a much smaller economic base than the U.S.A., the Soviet Union – as well as almost every less advanced nation in the world – is bound to show a larger percentage increase in output than the U.S.A. But the Eckstein staff calculation gives the Communists ammunition they don't deserve.

Are We Facing A Crisis?

The contrast drawn by the Joint Committee staff in postwar U.S. growth rates suggests that we are facing scarcely less than a crisis through paralysis of our economic growth which calls for drastic remedies. But this, as the full 1947 to 1959 growth record set forth in the table makes clear, is very definitely not the case. Our over-all postwar rate of growth, as measured by the gross national product in physical terms, has been 3.5 per cent per year, a rate nearly double the long-term growth rate of 2 per cent per year between 1909 and 1939. In the continuing fluctuations in the rate of growth which more or less inevitably characterize a relatively free economy, we have had some downs in recent years. **But our economy is now on the upbeat again. And at the end of this year, the U.S. economic growth rate for the postwar period can be expected to be 3.7 per cent per year.**

It is extremely important for the United States to continue to maintain this rate of economic growth or even to surpass it. Upon this effort depends our capacity to meet our defense requirements without dangerous strain, to provide an adequate margin for foreign aid, to improve our own productive facilities, and to continue to raise our own standard of living.

How not only to maintain but possibly improve upon our postwar pace of economic growth will be the subject of strenuous debate in the months ahead. However, the debate will have a much better chance of being constructive if the postwar growth record is seen in proper perspective. To this end one of the first things to do is to junk panic rousing statistical portrayals such as that in the Eckstein report.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nation-wide developments. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw

PRESIDENT

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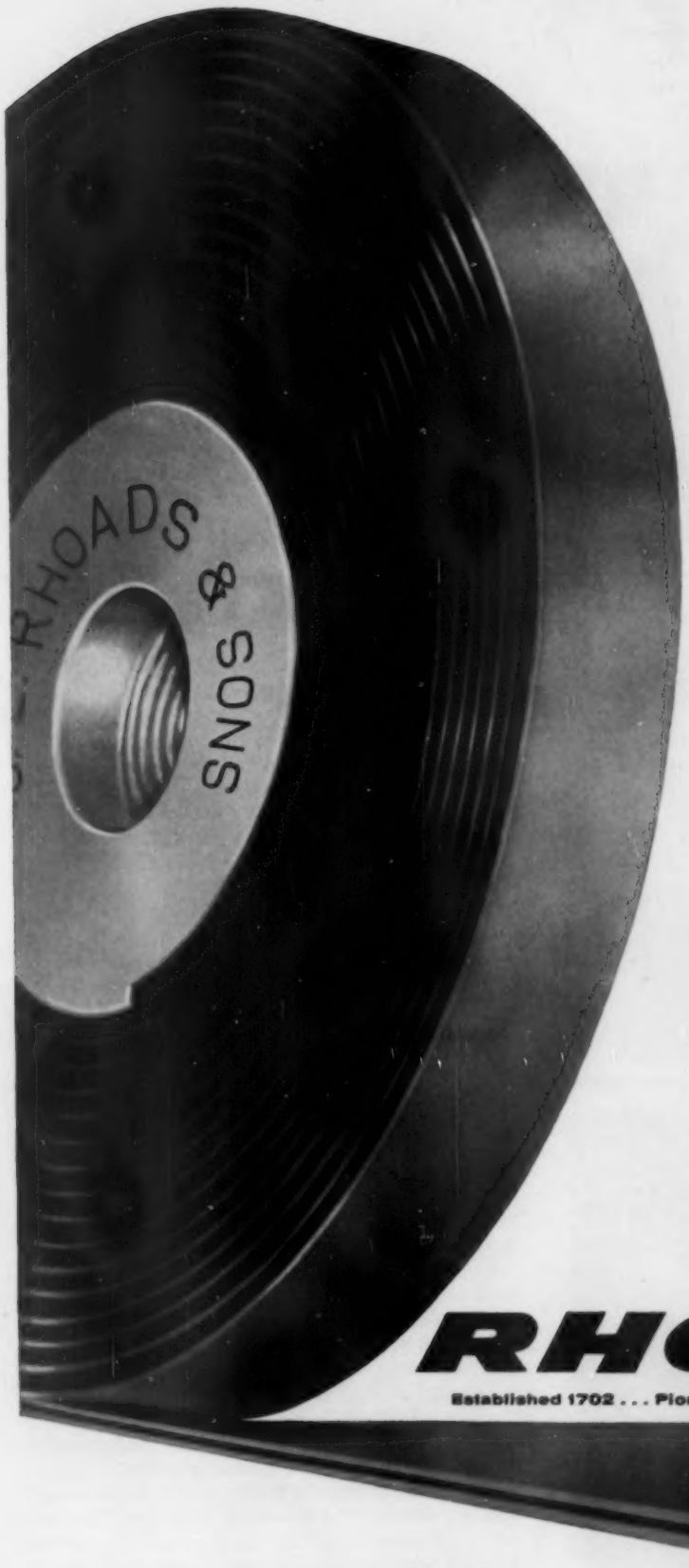

New Economies in Flat-Belt Operation

Tanastic, the nylon core leather belting by Rhoads, makes no maintenance demands. Will not slip because it is stretch-free. Maintains tension, runs straight and true. Tanastic starts up without slipping, and runs at highest speeds required in mill operation.

Ask a Rhoads belt-drive engineer about Tanastic nylon core leather belting, Texalon nylon core snythetic belting, or famous Rhoads Tannate leather belting. Literature on request. Address Engineering Department, J. E. Rhoads & Sons, Wilmington 99, Delaware.

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CIRCLE 117 ON READER SERVICE CARD

Tramp Iron—Bugaboo No Longer

Smashed machinery and work stoppage caused by tramp iron getting into the rolls of garnetting machines used to be a real problem at Antiseptic Mattress Co., West Lynn, Mass. A single small piece of metal in the works often caused damage that ran into hundreds of dollars.

To grab and remove this iron before it could cause trouble was a problem calling for outside help. Acting on recommendations from Eriez Mfg. Co., the mill installed two powerful magnetic separators. One magnet is located just over the spiked apron (photo); the other is between the picker and condenser.

Results have been excellent.

Carpet Finishing—Three at a Time

That's the way Highstown Rug Co., Highstown, N. J., transports continuous rolls of 15-ft.-wide sheared carpet from the shearing machine to the washing unit.

Highstown took a tip from steel mills in designing an overhead tram system to handle these rolls.

The operator in the center of the photograph controls the electrical system to raise, lower, and move the roll of carpet forward or backward.

This system results in finishing three rolls of carpets at once in a late-model washer-dryer without cutting apart and resewing the carpets.

Highstown weaves velvet carpets. But if you're weaving axminster carpets or tufting carpets on a tufting machine, this materials-handling system can also help you reduce handling costs.

New Dockboards Cut Mishaps

Tip or tilt motions built into this self-adjusting dockboard provide a safe, time-saving method of loading palletized cases into trucks for Klenzade Products Co.

Plant Manager R. L. Shogren says, "Prior to installation of these units in our new plant, we averaged one to two lost-time accidents every year. We feel that if we can eliminate just one accident every two years these dockboards will pay their own way.

"We find that our crews will go out of their way to use these dockboards. As our driveway is exposed, ice and snow conditions sometimes cause trucks to arrive at the dock in a canted position."

Shogren adds that the ability of the Adjust-A-Lip unit (the Kelley Co.) to adjust in the lateral plane means the lip stays firmly and constantly in contact with the truck bed at all times.

Shuttle Checks Trim Costs

When Mills, Mill No. 2 found a loom-parts cost reducer in a new control device, it didn't waste time putting the idea to work. Today, every loom in this subsidiary of Reeves Bros., Inc., at Woodruff, S. C., is equipped with these check controls (Page Belting Co.).

Looms and speeds are 46- and 48-in. K-models running at 165 ppm., 46-in. XK dobby-equipped looms at 158 ppm., 50-in. XD looms at 162 ppm., and 50-in. X-2 looms at 174 ppm.

Loomfixers say it's easy to keep shuttles boxed, and relatively few adjustments are necessary after weekend shutdowns.

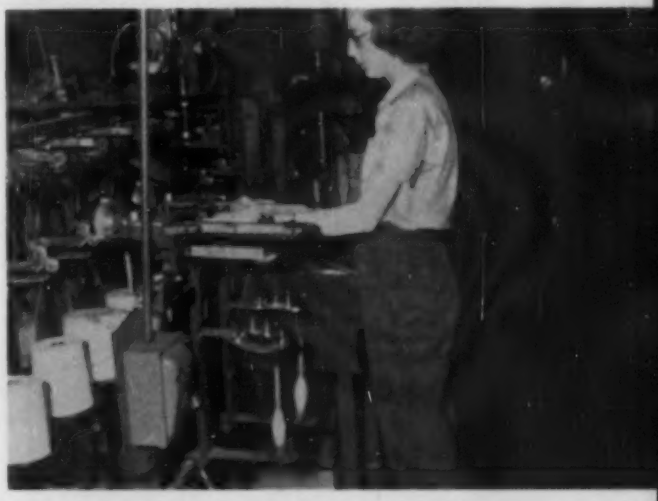
Two Extra Spindles Save $8,000

Beaumont Div., Spartan Mills, Spartanburg, S. C., is saving over $8,000 per year in its quilling department by filling up partially empty bobbins caused by supply packages running out. Bobbins less than half full formerly went into the waste bin.

This practice is saving the mill about 470 lb. of good yarn per week. Calculated value is 34.65¢ per lb., based on the current price of cotton.

How does the mill fill up the bobbins? Simply by using two extra spindles on its quillers and tying the ends of special cones into the partially filled quills when the regular supply package runs out.

Other partially filled bobbins can be used in place of cones as supply packages, which cuts costs even further. The spindles can be attached to the quiller, as shown, or set up at any convenient location.

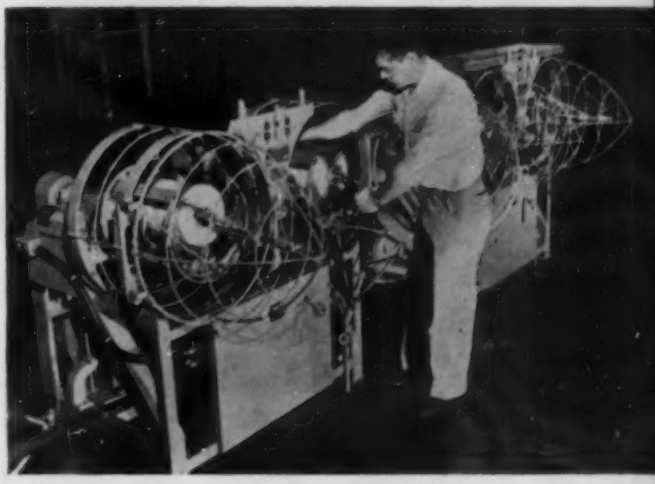


New Twist in Rope Making

This battery of high-speed twisting and winding machines, known as Whirlwind Twister-Winders, enables New Bedford Cordage Co., New Bedford, Mass., to twist and wind man-made and natural fibers into cordage at three times the rate of conventional equipment.

The machines (built by Warner & Swasey Co., Cleveland, Ohio) turn out knot-free 21-lb. yarn packages of quality nylon, Dacron, polyethylene, and other fibers for use in maritime and industrial ropes up to 3¼ in. in diameter. Only one operator is required for the equipment shown here.

Savings in production time and labor, according to New Bedford Cordage, will pay for the machine in just 3½ years. Little maintenance is required, power consumption is moderate, and special guards protect the operator from contact with the spindle.

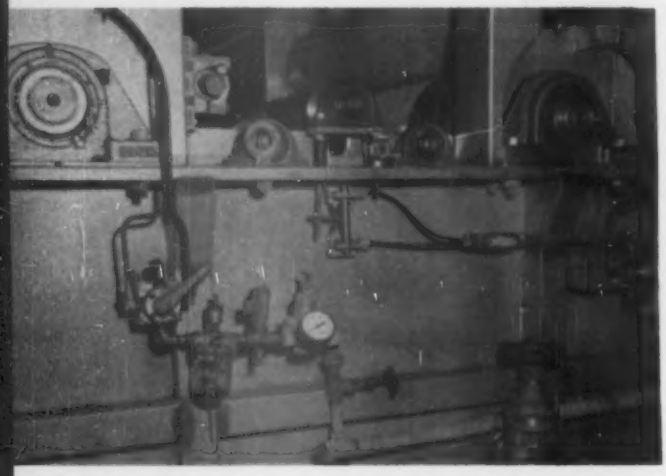


Polyethylene Wraps Boost Sales

Cinderella Knitting Mills, Inc., New York, N. Y., and Denver, Pa., attributes a 15 to 20% sales increase of its products directly to polyethylene overwraps and bags. Packaging costs are less too, according to R. Wise, company president, because there are fewer rejects, less waste, and the firm can stock large quantities of film without fear of deterioration.

Customers apparently prefer polyethylene to other wrapping material because of its soft hand and good appearance.

Cinderella is currently overwrapping 25% of its production of 264,000 garments a week on a Hayssen automatic wrapping machine, which will wrap 900 dozen garments per day with the help of two employees. One girl feeds the unwrapped garments to the machine, the other packs the finished product.

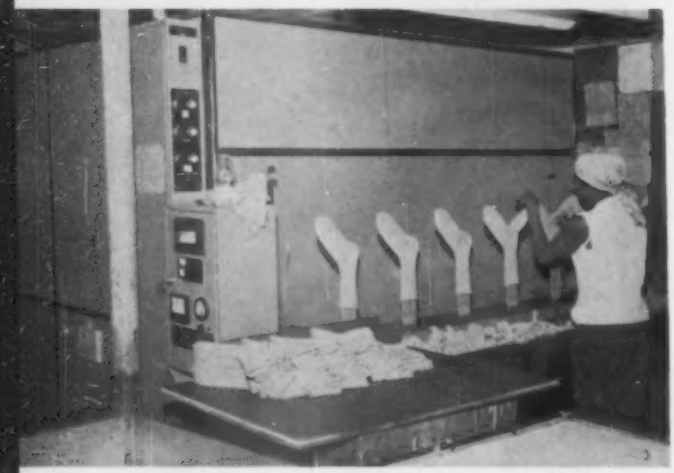


Spring-Loaded Roll Pilots Range

Russell Mfg. Co., Alexander City, Ala., cuts its losses from wrap-ups and run-outs in continuous processing ranges by mounting one guide roller near the entering end of each range as shown in the picture. The bearing is pivoted on one end and rides against a spring on the other.

The usual bolt on the free end of the bearing block is replaced by the long stud that moves in a hole in the frame of the wash box.

The stud carries an adjustable arm that actuates a conventional limit switch. When the range is in operation, tension caused by the fabric depresses the roll and the range gets power. If the goods break out, the roll rises and the limit switch breaks the circuit. The range stops within a few yards, and the rethreading process is fairly simple.



Hosiery-Boarding Output Rises 28%

Looking for a faster way to preboard hosiery? Then look at what The Adler Co., Cincinnati, Ohio, has done in speeding up and cutting costs in preboarding white wool hosiery.

Adler equipped an oven with 108 Chromalox electric radiant heaters rated at 800 w. each.

Production rate with this new system is 38- to 48-doz. pairs of hosiery per hour depending on the wool content of the socks. Minimum power cost is only 2½¢ per dozen pairs. The oven is operated 24 hr. per day and is shut down only on weekends.

Production with the infrared heaters is 28% higher than with the older system that used steam.

The new system will be a closed system with some air recycled to temper the air on cold days and lower the relative humidity on very humid days.

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No tools needed and only 4 separate parts to handle.

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The "quiet zone" below the baffle holds 53% more collected air-line contaminants. Requires less frequent draining.

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New, stronger transparent bowl has greatly improved resistance to fatigue failure.

PLUS *these important benefits:*

- **Highly effective removal of solids.**
- **Optional interchangeable filter elements—** 74, 64, 25 or 5 micron.
- **Reduced service time**—the simplest, easiest filter to disassemble and clean.

Where protection for transparent bowls is required,
a metal bowl guard, held in place by the clamp ring, is available.

For complete information about Norgren's complete line of manual drain and automatic-drain compressed air line filters, call your nearby Norgren Representative, listed in your telephone directory—or WRITE FOR BROCHURE NA-1.

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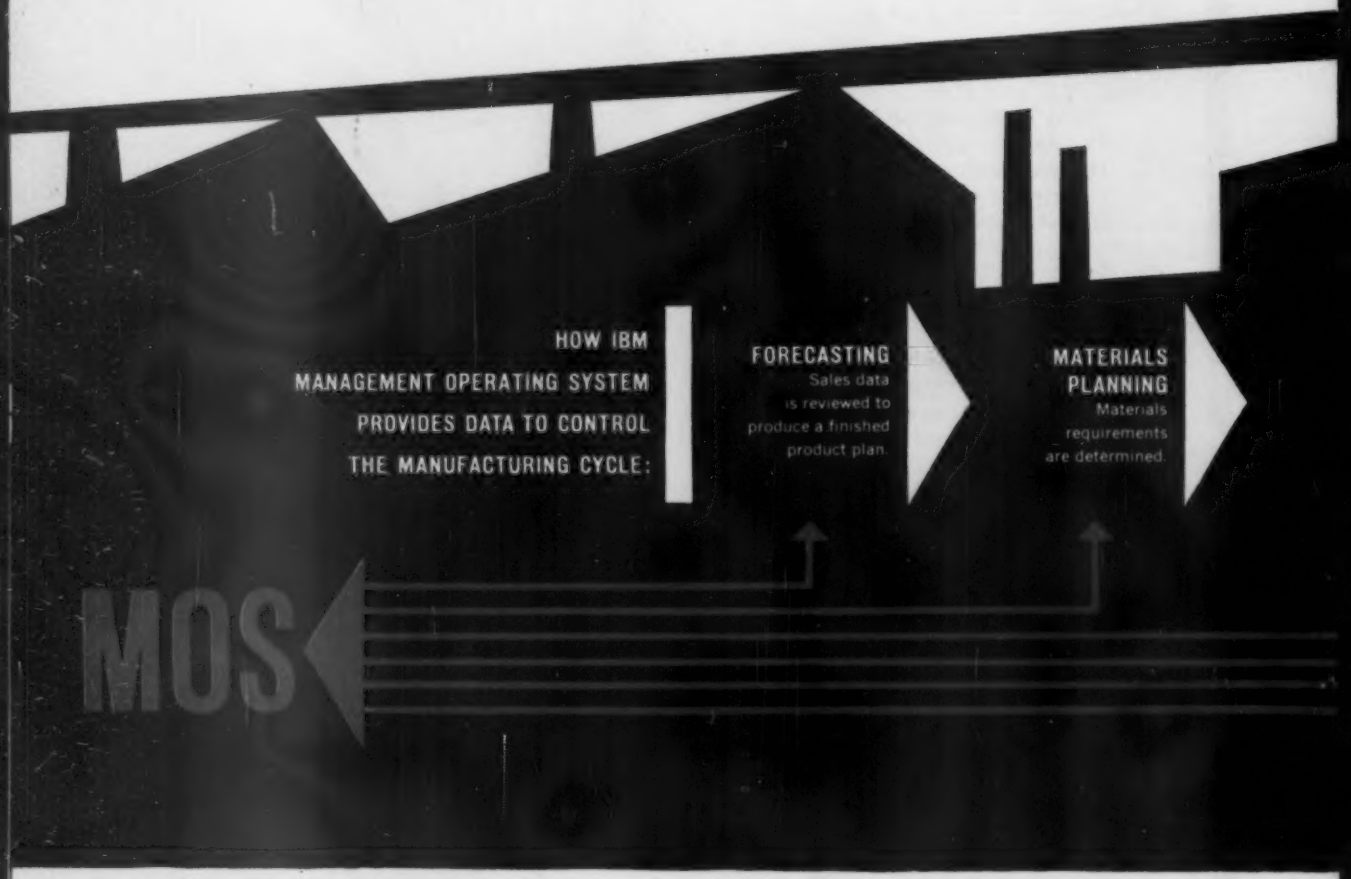
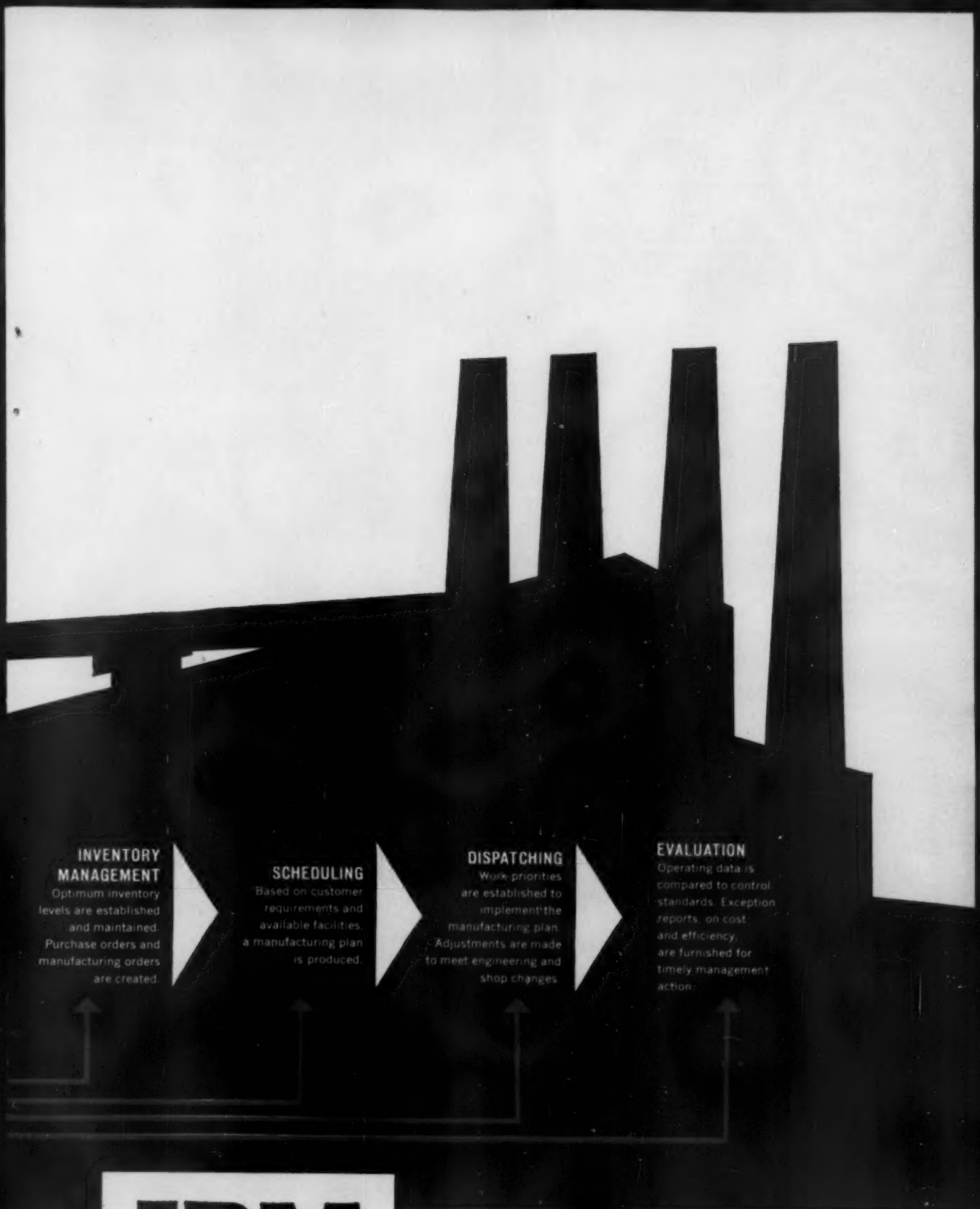
For full information about the IBM Management Operating System, contact your local IBM office.


HOW IBM MANAGEMENT OPERATING SYSTEM PROVIDES DATA TO CONTROL THE MANUFACTURING CYCLE:
FORECASTING
Sales data is reviewed to produce a finished product plan.
MATERIALS PLANNING
Materials requirements are determined.
MOS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BALANCED DATA PROCESSING

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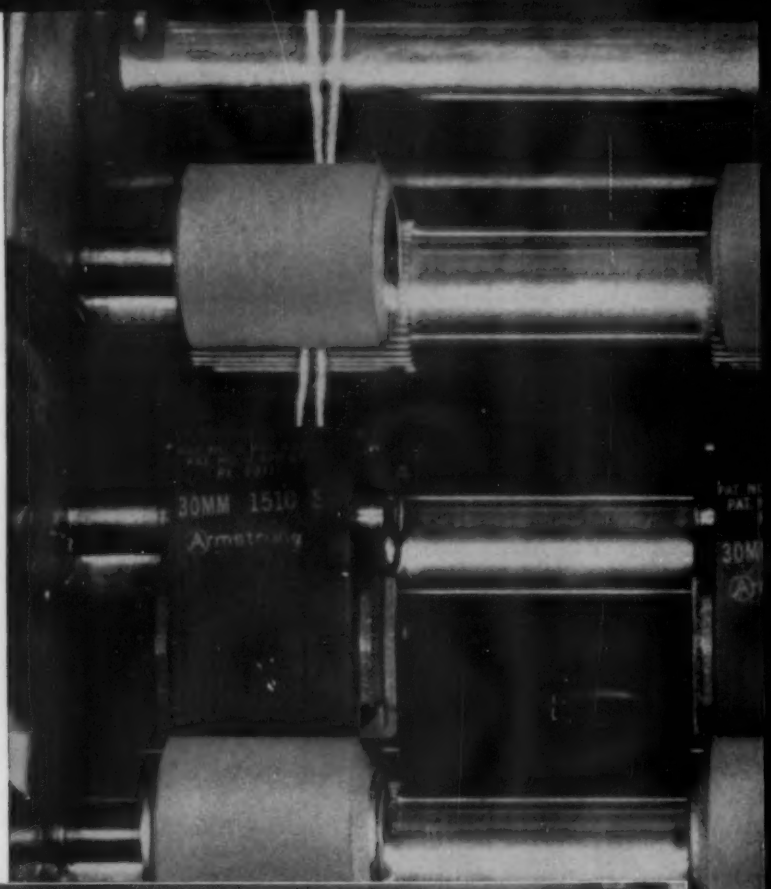
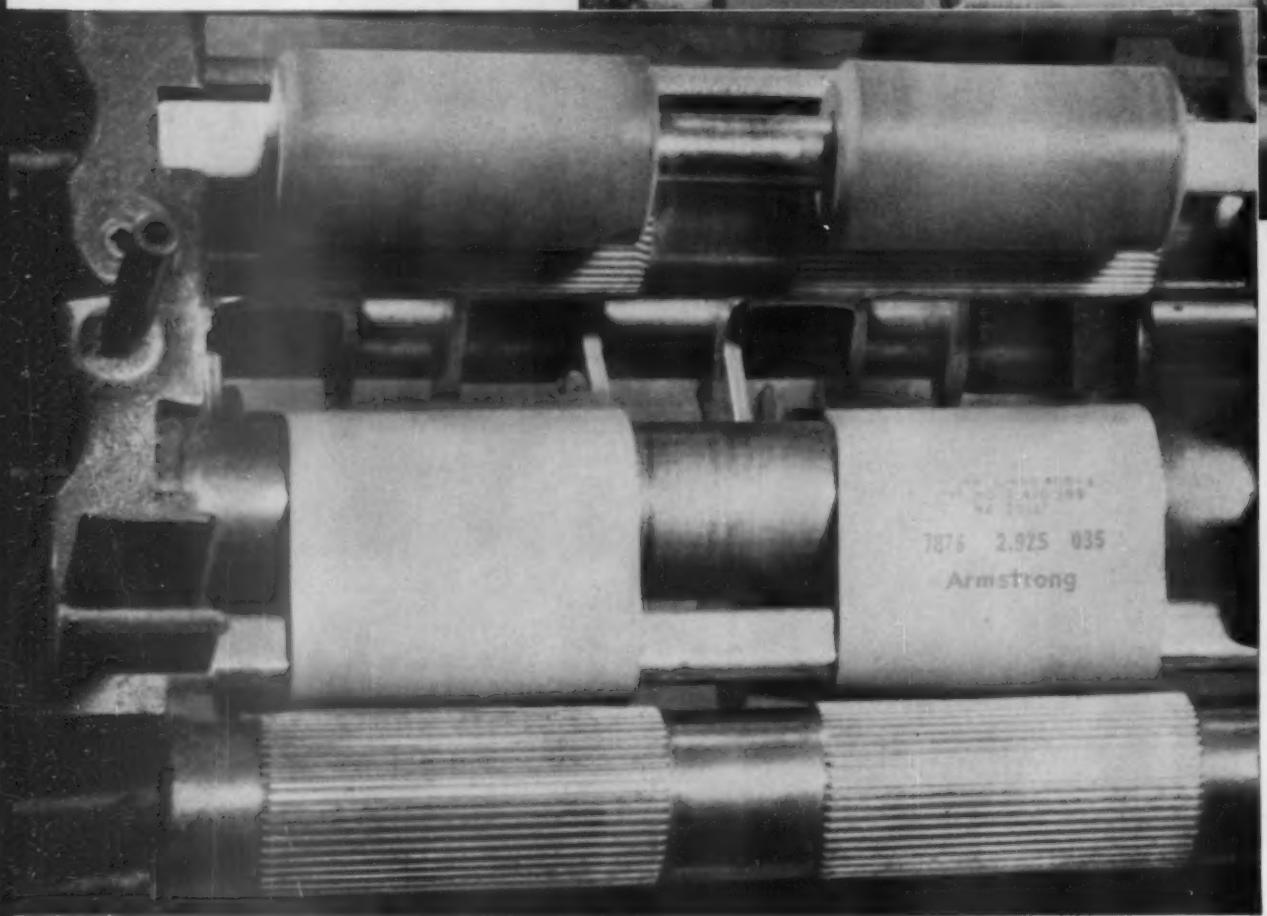
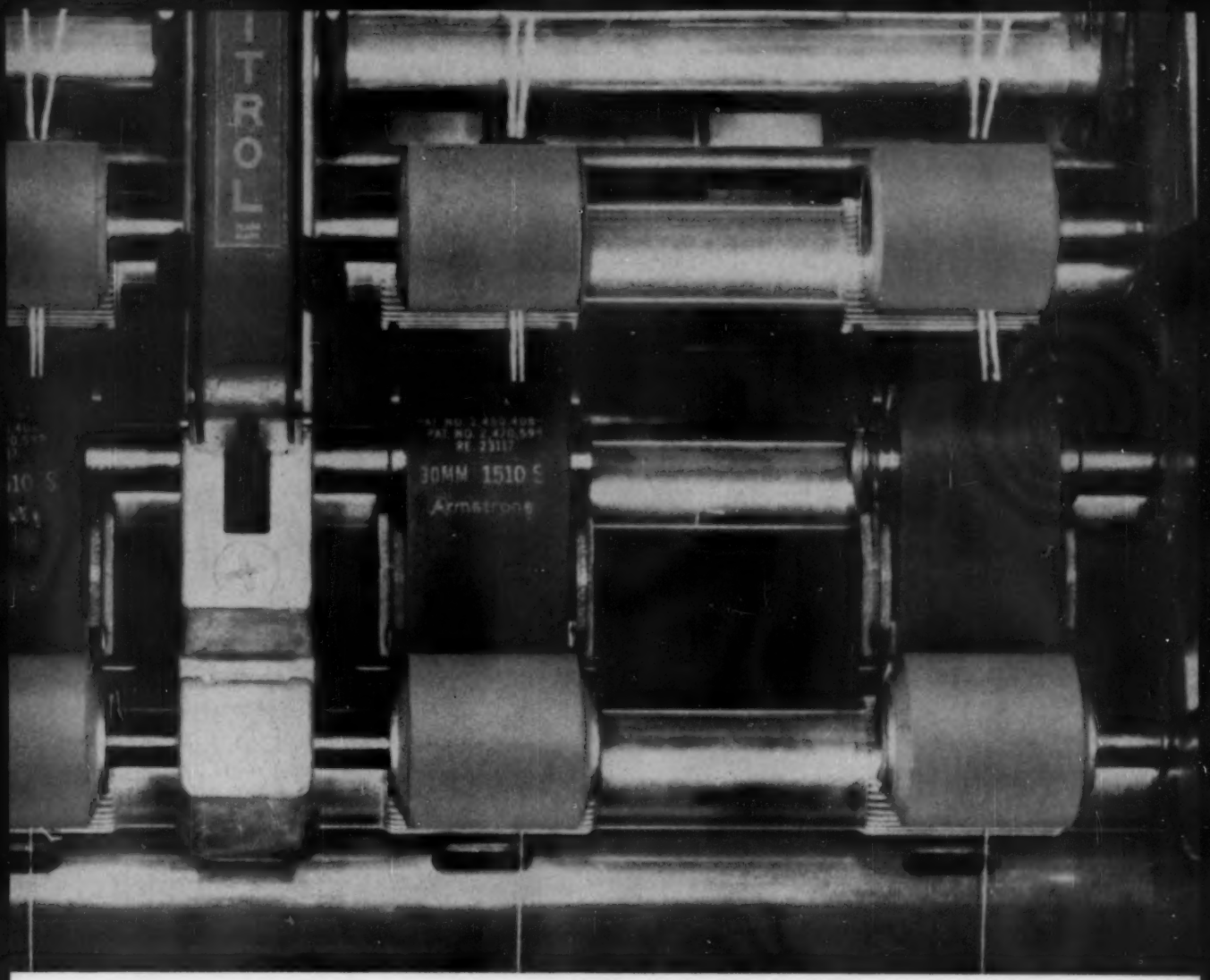
For close-pin double-apron systems, use Accotex NO-7075. This black-and-white apron pioneered the two-compound principle in aprons. Special synthetic rubber compounds give it smooth drafting properties and good resistance to abrasion.

For long-apron systems, Armstrong Accotex NO-7876 is recommended. Two special rubber compounds give it super-flexibility, superior fiber-handling characteristics, and unusual resistance to flex cracking and ozone. ▼







On any drafting system, Accotex Aprons help you turn out quality yarn

The many high draft systems and change-overs available today differ in important details . . . but they all require precision-made spinning aprons for best performance. That's why most mills specify Accotex Aprons when they place orders for new or modernized equipment.

These aprons turn out strong, uniform yarn because they are designed to the requirements of the frame on which they're to run. For example, specially compounded synthetic rubbers have just the right frictional characteristics to give you smooth drafting action and excellent yarn control.

These special rubbers also have high resistance to tearing, abrasion, ozone, and yarn-treating chemicals. As a result, they give you years of service on any high draft spinning system.

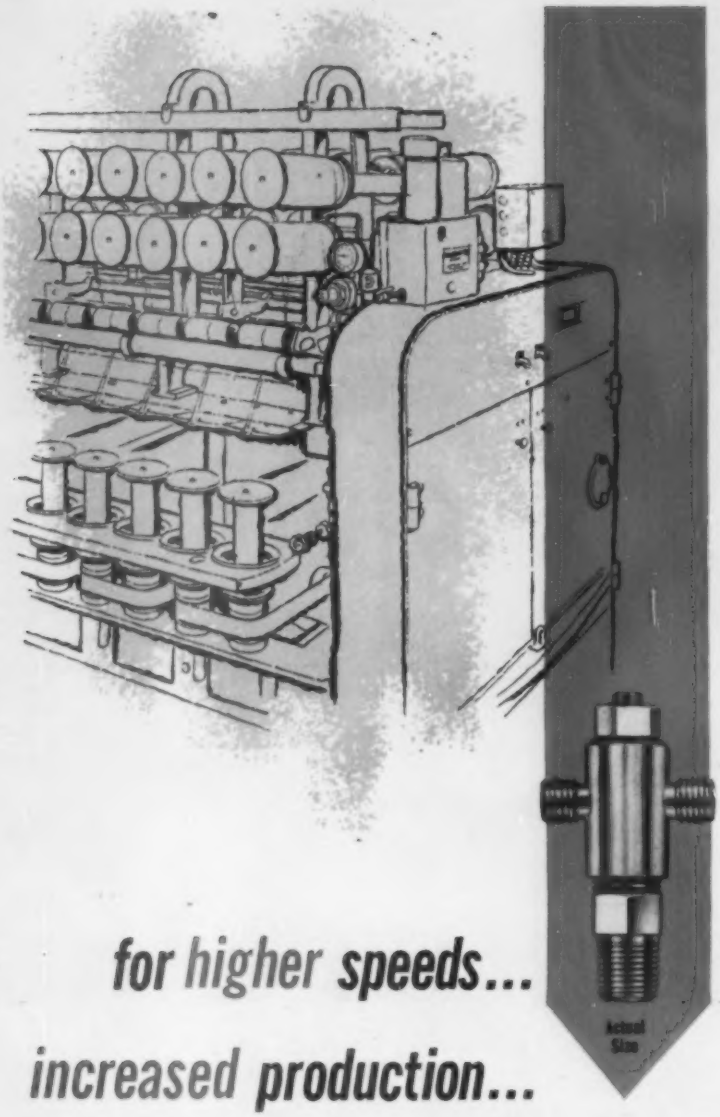
The construction of Accotex Aprons also contributes to their outstanding performance. A strong, straight-line cord interliner . . . a construction developed and patented by Armstrong . . . maintains dimensional stability.

Your Armstrong man will be glad to give you more information on Accotex Aprons. See him or write to Armstrong Cork Company, Industrial Division, 6406 Dauphin Street, Lancaster, Penna.

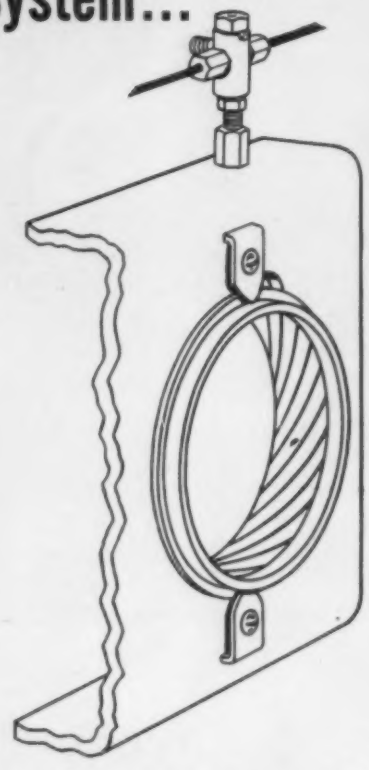
Armstrong ACCOTEX APRONS

1860–1960 Beginning our second century of progress

CIRCLE 125 ON READER SERVICE CARD



New Adjustable Accumite® Ring Lubrication System...



for higher speeds... increased production... less product spoilage... reduced power costs!

When you order new spinning or twister frames (or just new rings), specify Alemite's new adjustable Accumite System for increased production and lower costs. This accurate, economical, low-pressure lubrication system assures automatic ring lubrication while the machine is in operation. Adjustable measuring valves meter exact amounts of refinery-clean lubricant to every ring on the frame rail.

Because an Accumite System maintains a constant, proper lubricant film, it assures even tension and uniformity of thread. It virtually eliminates product spoilage due to over lubrication – eliminates drip and spray. The Accumite System reduces lubricant consumption and prolongs ring life at higher operating speeds.

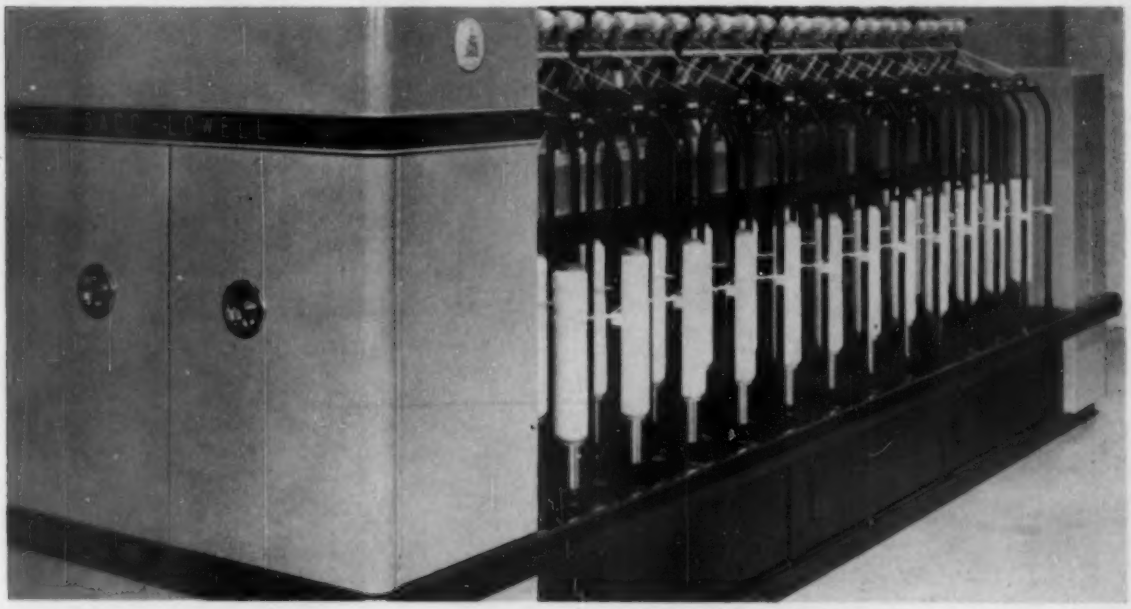
Send for all the facts on the Alemite Accumite System – important production tool of the textile industry!

Symbol of SW Excellence

ALEMITE DIVISION
STEWART-WARNER CORPORATION

Dept. X-60, 1850 Diversey Parkway, Chicago 14, Illinois

For more information on any of these items, circle appropriate number on the Reader Service Card, which appears inside the back cover.



Bigger Roving Package, Higher Speed

First basic changes in roving-frame design and construction in many a year are embodied in the completely new Rovematic machine, shown just a few days ago at Atlantic City.

The frame, which carries a 14x7 package at 1,200 rpm.—about 40% faster than conventional frames—employs new principles in housing design, spindles, traverse, flyers, drive, and head end.

Most noticeable feature: no cones or belts in the undercarriage. Space under roller beams is free of control elements and open for easy cleaning. Drive components are enclosed in the head-end cabinet along with all adjustments and change gears.

Telescoping spindle design discards heavy traversing carriage, long reversing shafts, and other carriage lifter mechanisms, counterbalance weights and the conventional horsehead drive.

Telescoping arrangement consists of two cylindrical elements, (bolster and spindle) rotationally keyed together to turn in unison. A lead screw, mounted within the hollow spindle, is driven at variable speed by the bottom longitudinal driveshaft. Spindle and bolster are driven at a variable speed by middle shaft. Flyer is driven at a constant speed by top shaft. When lead screw and spindle turn at the same speed, no traverse results. But if speeds differ, the spindle will ride up or down on the lead screw and carry the bobbin with it.

Traverse is accomplished with no lead-screw reversal motion, only through slight changes in relative speed. This action cuts out "dwell" associated with torsional deflection of the long reversing shafts in standard frames.

Unlike open-leg flyers, the Rovematic flyer is tied together at top and bottom. This arrangement, plus a lightweight nylon presser, reduces spread to a negligible degree even at very high speeds. Another time- and labor-saver: an automatic positioner that stops flyers at the best place for piecing up.

Focal point of the head end is the tandem differential—actually two differentials back to back. Here power is integrated and distributed.

Compounded with the flyer drive gear is the bobbin ring gear that meshes with the planet gears. The planet gears are carried in a cage integral with the bobbin driving gear and they mesh with the bobbin-drive sun gear.

Winding speed—which varies with package diameter—is controlled through a PIV (positive infinitely variable) speed unit.

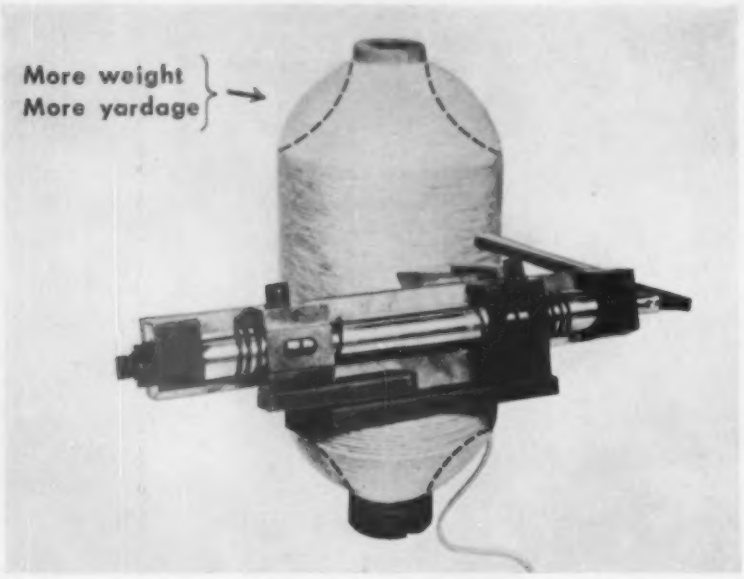
Drafting system consists of the FS-2 element combined with the Tru-Set top arm. This gives close fiber control.

Lubrication system is self-contained, requires only periodic checks of oil level.

The doffing procedure has been simplified and all controls are in the head end. Packages can be slipped off the spindles without removing the flyers. **Textile Machinery Div., Saco-Lowell Shops. For more details on this item, circle E-1 on the Reader-Service card.**

For more Equipment and Supply News . . . turn the page

For more information on any of these items, circle appropriate number on the Reader-Service Card, which appears inside the back cover.



Now—More Roving per Bobbin

The new roving-frame bobbin builder in the photo above is called the Vari-Pitch Builder. It's brand new. It means anywhere from 8 to 50% more weight of roving per bobbin. It's suitable for use on Whitin, Saco-Lowell, Woonsocket, Whitin-Woonsocket, and Lowell roving frames.

Key to these gains in package weight is high-tension winding (without any increase in end breaks) plus a new package profile. Results: less creeling per period cycle and thus more spinning-room production; almost no creel breaks from roving over-runs, thus more spinning frames under spinner control and higher machine efficiency.

Mill runs to date give the following indications: (1) With present roving frames perhaps 20% more spinning frames may be added. (2) Fewer roving tenders are needed. (3) Fewer bare bobbins are needed. (4) More production is possible without changing over to larger roving frames. (5) There are fewer piece-ups and end-downs in the spinning room. (6) No changes are needed in routines for handling roving bobbins. (7) There's less sloughing-off in handling. (8) Investment is paid back in about six months.

Research that led to development of this bobbin builder began at the Institute of Textile Technology, Charlottesville, Va., some four years ago.

Result of this research is a variable-pitch single-groove builder screw with actuating follower pins in the builder jaws to control the shortening of the layers as the package is wound. The length of the stroke decreases at a slower rate as the diameter increases, thus giving a convex contour.

The Vari-Pitch Builder is supplied as a complete assembly. *Precision Gear Div., Perfecting Service Co.*

For more details on this item, circle E—2 on Reader-Service Card.

E—3—Rayon cord strapping, called Avistrap, is lightweight, low-cost, easy to handle, safe (no sharp edges), easily disposable (can be burned). Tightens without cutting material or carton. Can be imprinted with company or product name. Is shipped on pallets or cartons containing 1 or 4 coils. A 1,000-yd. spool weight only a fifth as much as comparable steel strapping. Applications: palletizing, baling, securing drums, and many other textile-mill uses. *Industrial Packaging Department, American Viscose Corp.*

E—4—Multipoint recorder, model 15 ElectroniK, used for processes where frequent record changing is required, can be converted easily to change the number of points being measured, the actuation, or the range. Uses of the recorder include spot checking boiler tubes, oil temperatures and central stations. Universal models are equipped with measuring circuits for potentiometers or resistance thermometers and zenor diode regulated constant-voltage units. Fixed cycle or synchro-balance printing models are available. *Brown Instruments Div., Minneapolis-Honeywell Co.*

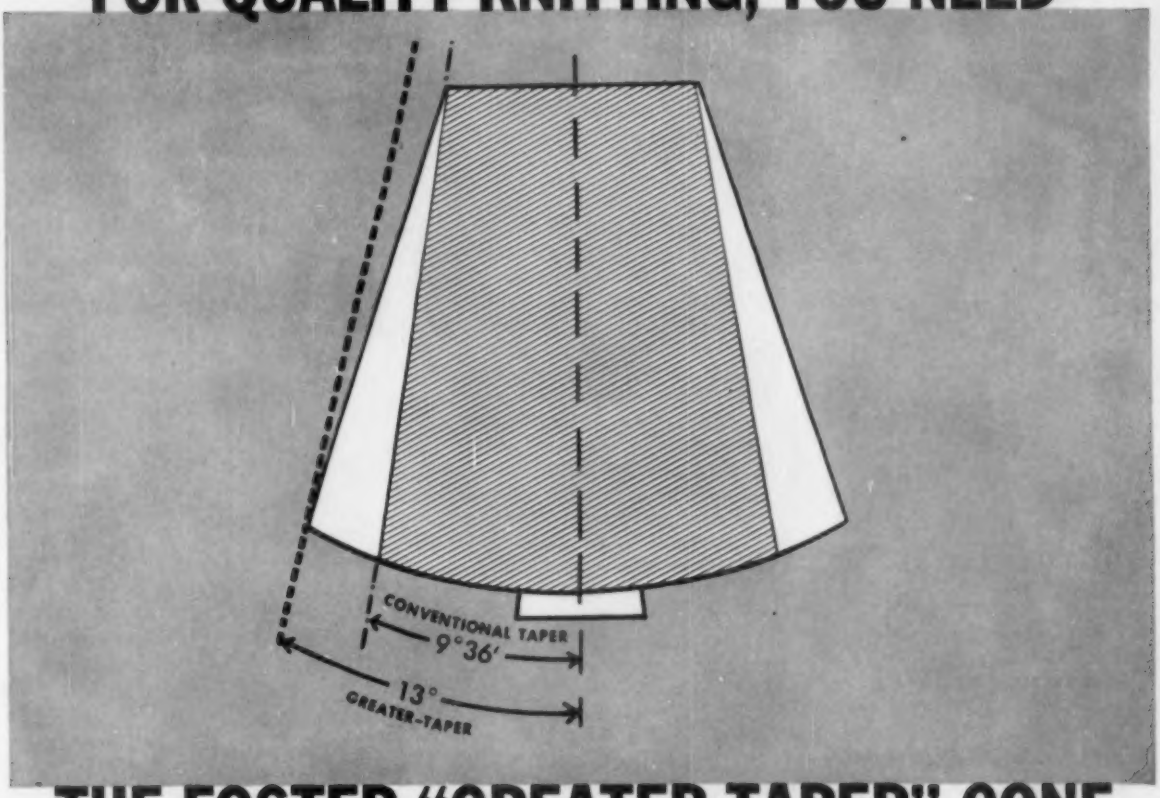
E—5—Moisture Meter, called M-200, reads moisture content in natural and man-made fibers and blends without calibration.

The instrument also can be used to measure moisture during a production run of materials in motion. The continuous measurements are said to be more accurate than intermittent checks on moisture content. *Strandberg Engineering Laboratories, Inc.*

E—6—Nylon castings now are available (in short runs) in sizes up to 6 lb., thus extending nylon's range of usefulness in solving problems of lubrication, machining, corrosion, abrasion. Nylocast, a licensed European nylon-casting process, uses higher-viscosity nylon. Almost no limit on cast-in inserts, threads, lugs, intricate shapes, or varying thicknesses. *Nylon Molded Products Corp.*

. . . *Turn to page* 130

FOR QUALITY KNITTING, YOU NEED



THE FOSTER "GREATER-TAPER" CONE

OTHER ADVANTAGES OF MODEL 102

1. Convex base of cone also prevents snags.
2. Highly efficient slub catchers automatically inspect yarns.
3. Ribbon breaker prevents ribbon wind.
4. Idler shell on winding drum prevents chafing.
5. Doubles production and reduces operating costs ⅓ over obsolete machines.
6. Repair costs as low as $10 per year per 100 spindles.
7. Yarn conditioning attachment if desired.

Tight stitches, in a knitted fabric, caused by snags, do not make for quality merchandise.

You can eliminate or minimize tight stitches by using a cone that permits the yarn to clear the nose on its way to the needle, even when the cone is full.

The Foster Model 102 "Greater-Taper" Cone does just this, because, although starting out with a 9° 36' taper, it ends up with a 13° taper.

If you spin sales yarn for knitting, use the Foster Model 102 winder to give knitters the cone they need. If you wind cones in your own plant, the Foster Model 102 will give you cones that your knitting machines need.

Bulletin A-95-A on request

THE FOSTER MODEL 102 WITH YARN CONDITIONING ATTACHMENT

FOSTER MACHINE COMPANY

A Yarn Winder for Every Purpose

Westfield, Massachusetts, U.S.A.

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CIRCLE 129 ON READER SERVICE CARD 129

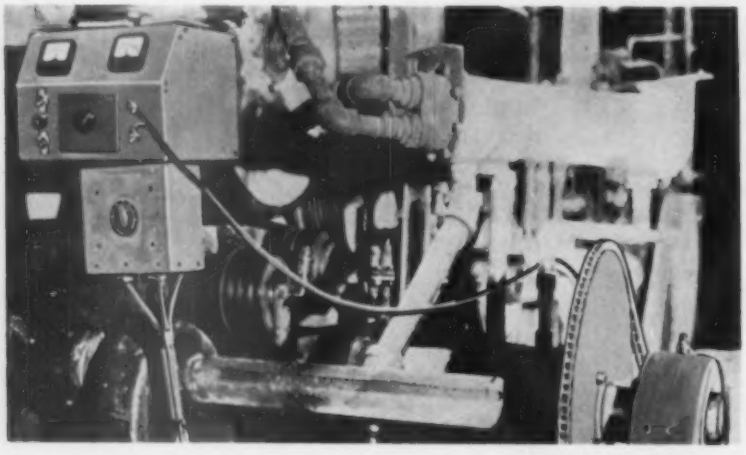
For more information on any of these items, circle appropriate number on the Reader Service Card, which appears inside the back cover.

Nearly Any Package Size

The swing-arm assembly that now accompanies this manufacturer's creels will handle a wide variety of package sizes with minimum need for special adapters. The bowed-spring spindle is suitable for parallel tubes, bobbins, and the like. For medium-size packages and cones a holder snaps into position over the bowed-spring spindle. A holder is also available for packages that have large inside diameters.

Adapters are designed for quick change, thus cut time lost in change-overs. The swing-arm assembly has been redesigned to prevent sagging caused by packages that are too long or too heavy. *Edward J. McBride Co.*

For more details on this item circle E—7 on Reader-Service Card.



Rewind Tension Just Right

A rewind tension-control unit provides uniform tension on rolls, thus reduces need for operator's attention during unwinding and rewinding. The device features the 15LT automatic tension-control clutch. In one application it replaces a slip-belt rewind drive, runs at web speeds of 400 to 1,000 fpm. Unit uses oil for torque production, for cooling the system, and for lubrication. Pushbutton control box simplifies adjustments. Tension remains constant and accurate through the whole speed range. *Web Control Corp.*

For more details on this item, circle E—8 on Reader-Service Card.

E—9—Antiseize and lubricating compounds, trademarked Goop, prevent seizing and galling. Resist water washout, reduce take-up torque on threaded parts, withstand high temperatures, high voltage, and cyclic thermal stress. *Crawford Fitting Co*

E—10—Miniature pressure switch exceeds the standard requirements up to 200-psi. under vibration, shock, and acceleration test conditions. The switch is less than 1 cu. in. in size, and weighs only a little over 1 oz. A pressure capsule and snap-action switch are enclosed in an all-stainless-steel housing. Operation is simple and the setting is positive even under severe shock and vibration conditions. For electrical switching in response to pressure changes where switch size and weight are important, the switch is suitable. *Bristol Co.*

E—11—Magnifying inspection lamp provides glare-free lighting without distortion of the magnified image wherever small parts are assembled. Combines 22-watt circlite lamp with a 5-in. magnifying lens. Swivel head and slip-proof arms adjust easily. *Swing-O-Lite, Inc.*

E—12—Retractable bobbin, used as take-up bobbin in steaming man-made-fiber threads, replaces cardboard cops. Threads are steamed on the bobbin. Cylindrical shell retracts during steaming, then expands to original size, 2 2/8 in. *Societie Industrielle Allegro S. A.*

E—13—Heavy-duty gasket material, called Spaulding 44, releases without delamination even after long periods under heavy pressure. A release coating prevents gasket sticking without special graphite coating. The gaskets are resistant to aromatic fuels and hot oils. The material's tough rag-paper content assures high tensile strength in both machine and cross-machine directions. Other features are uniform compressability, thickness recovery after release from pressure, and easy release. *Spaulding Fibre Co.*

. . . *Turn to page* 132

U. S. ROYAL V-BELTS from the Power Unlimited complete belt line

Exclusive new process gives

balanced driving power

Now you can give your equipment the kind of driving power that comes only from V-belts that are as close-to-perfect as the world's most advanced manufacturing methods can make them. Specially developed equipment automatically controls thickness, weight, density, length, and tension members so precisely that each U. S. Royal gives you *balanced* driving power that pays off in every aspect of a belt's performance.

Smoother running. Variations inherent in other belts lead to vibration, intermittent slippage, increased bearing wear, excessive heat build-up, and early belt failure. Because of the "balanced driving power" resulting from exclusive manufacturing processes, U. S. Royals are the sweetest running belts in the business.

Unequaled length stability. Test after test has demonstrated that each U. S. Royal V-Belt with balanced driving power is a perfect working match for the others in its set. And every U. S. Royal V-Belt on a multiple drive will *continue* to pull its share of the load long after other "matched" belts have begun to assert their individuality.

No weak spots. Because there are no "weak links," you get longer lasting driving power and greater freedom from maintenance than ever before. Take advantage of the balanced driving power only U. S. Royal V-Belts offer. Your "U. S." Power Transmission Distributor has full stocks to service you promptly.

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

For more information on any of these items, circle appropriate number on the Reader-Service Card, which appears inside the back cover.

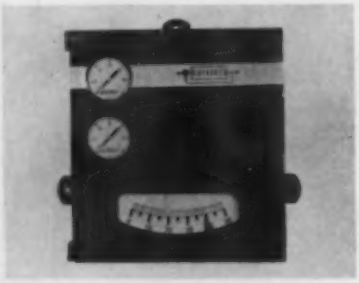
E—14—Scrubber-vacuum operates in aisles 10 ft. wide, in plants with minimum of 50,000 sq. ft. to clean. Capacity of unit (Model 72-F) is 64,500 sq. ft. per hour. Four 18-in. brushes operate at 180 rpm. under variable pressure to the floor. Brushes agitate cleaning solution dispensed from 150-gal. tank. V-shaped squeegee funnels dirt into 150-gal. pickup tank via 75cfm. vacuum. Unit is powered by air-cooled 27-hp. gas or propane engine. Requires one operator-rider. Operates at 2 to 3 mph., travels at 15 mph. **Finnell System, Inc.**

E—15—Doffer-gear take-up provides a tight fit, thus eliminates chief cause of gear and shaft wear. Device is easy for card-room fixer to apply. Shaft is tapered to fit sleeve. Inside diameter of doffer gear is bored to same taper. Collar is screwed on sleeve and tightened. Machining, grinding, polishing assure a tight fit, hold doffer gear properly, thus prevent wear and delay need for replacement. **Saco-Lowell Shops.**

E—16—Switch interlocks for timers, providing increased contact reliability by snap-switch interlocks, are now available on Type B and C timers. These timers have an adjustable timing range of up to 3 min. and can be furnished with one or two single-pole, double-throw, instantaneous and snap-switch interlocks. For simplified maintenance, both the timer head and magnet assembly are removable from the front. If either of these assemblies requires replacement, it can be changed easily without removing the complete timer from the panel. **Square D Co.**

E—17—Spray system, called "Spray-Rite," is air operated (60 to 125 psi.), has flexible controls. Nozzles may be set to apply spray from any angle, control it from fine to coarse. System is suitable for almost any liquid, is especially useful for lubricating and cooling in connection with cutting tools—turning, milling, grinding, tapping, reaming, sawing, and punchpress operations. **Oil-Rite Corp.**

E—18—Submersible sump pump, lightweight and low-cost, is called Dynasump. The pump and motor are combined in a single leakproof unit. The pump is made entirely of noncorrosive materials. It can be installed by simply connecting the discharge and plugging in the waterproof power cord. Nonclogging pressure switch provides fully automatic on-off operation without the use of floats. Dimensions: 9½ in. high, 5½ in. in diameter. Weight, 8 lb. Capacity: 700 gpm. at 4-ft. head, 200 gpm. at 10-ft. head. **Fostoria Corp.**



E—19—Pneumatic controller (A/D Model 624) is position-balance indicating type, features modular design for easy servicing, high stability for close process control. Available for control with 1 to 400% proportional band and with reset control with 0.1 to 50 repeats per minute reset rate. Applications: pressure (full vacuum to 10,000 psi.), temperature (minus 100° to 1,000°F.), flow and differential pressure (mercury and dry-type meter bodies), humidity (0 to 100%), and differential liquid level. Size: 8x8x5 in. **Bristol Co.**

E—20—Lift truck, newly designed, is called "Van-Stack." It stands less than 6 ft. high even with overhead guard attachment in place (see photo); can work in warehouse aisles as narrow as 3 ft.; can drive straight into trailers, trucks, boxcars, vans, and the like where headroom is low, thus speeds carrier loading; can stack loads up to 15 ft. high with High Free Lift Triple Mast. **Towmotor Corp.**

. . . Turn the page

Rewinding operation at one of the ten Sonoco paper machines

Sonoco makes its own paper!

The entire textile industry benefits from the fact that Sonoco makes its own paper. Here's how—

The dependability and economy of Sonoco cones, tubes, cores and spools begin with the paper from which they are made. To meet customer specifications, Sonoco operates ten modern paper machines to produce over 250 different weights, grades, surfaces and colors. Sonoco, therefore, is able to exert close quality control from raw material to finished product. That's why you can depend on a Sonoco product to perform the function for which it was designed—*no more, no less.* This saves you money, improves the quality of your production and helps reduce downtime.

Only Sonoco, in its field, offers a completely integrated manufacturing operation and 60 years' experience in creating and producing all types of paper textile carriers. Sonoco has the necessary knowledge, skill and capacity to meet the ever-changing techniques of the textile industry. *Let Sonoco experience help you!*

SONOCO
Products for Textiles

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CIRCLE 133 ON READER SERVICE CARD

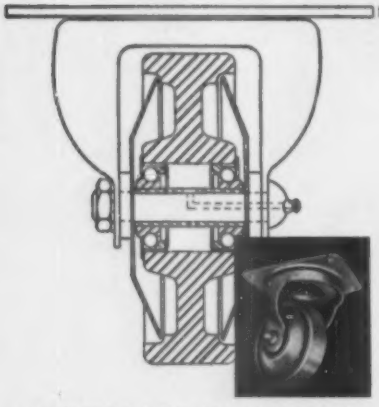
ACHIEVED!

Textile Casters That Won't Bind!

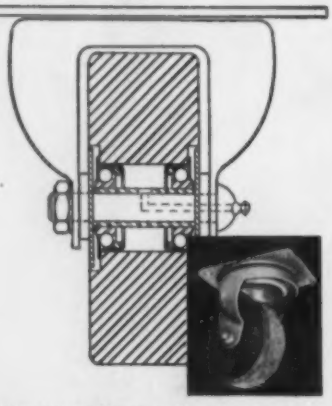
FAIRBANKS TEXTILE CASTERS

Never Before Such Sure-Fire Protection Against Threads And Lint!

Available In 2 Wheel Types:

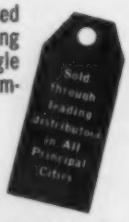


Precision cast, ballbearing semi-steel wheel—perfect concentricity; smooth, thick tread and big tread edge radius — protects floors and rolls and swivels easier. Threadguard protects in two directions: vertically, by tight fit to concentric inner edge of wheel tread; horizontally, by tight fit to molded step on web of wheel. Spacer washer, between threadguard and caster leg, eliminates V trap—allows lint and thread to fall free or, if caught, cleaning out without removing wheel. Available in 4 and 5 inch sizes.



"LAMILON", All-Plastic, ballbearing wheel permits standardization on one wheel for any section of the plant. Protects wood and concrete floors, resists sticking of ring travelers and gives excellent service in bleacheries and dye houses. Tight flush-face threadguard has very close fit in machined recess in wheel. Flush-face design decreases chance of falling lint and thread catching in wheel. Spacer washer, between threadguard and caster leg, eliminates V trap—allows lint and thread to fall free or, if caught, cleaning out without removing wheel. Available in 4 and 5 sizes.

Fairbanks patented "LOCKWELD" Steel Swivel Casters have eliminated the king-pin — major cause of swivel caster failures — providing stronger, easier swiveling, longer lasting casters. Available in single ball race, regular duty, sizes 2 to 6 inch; double ball race, medium-heavy duty, sizes 3 to 8 inch, with matching rigid casters.



THE **Fairbanks** COMPANY

Executive Office: 393 Lafayette Street, New York 3, New York

Valves • Dart Unions • Casters • Trucks • Wheels

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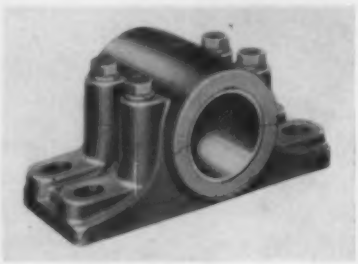
Equipment and Supply News

. . . *Begins on page* 127

For more information on any of these items, circle appropriate number on the Reader-Service Card, which appears inside the back cover.

E—21—Epoxy floor is resistant to most acids, alkalis, and solvents. It cures quickly, withstands abrasion, and can be used to resurface worn floors. The floor is a topping of about ⅛ to $\frac{3}{16}$ in. thickness and is applied over a previously prepared slab. **Kalman Floor Co.**

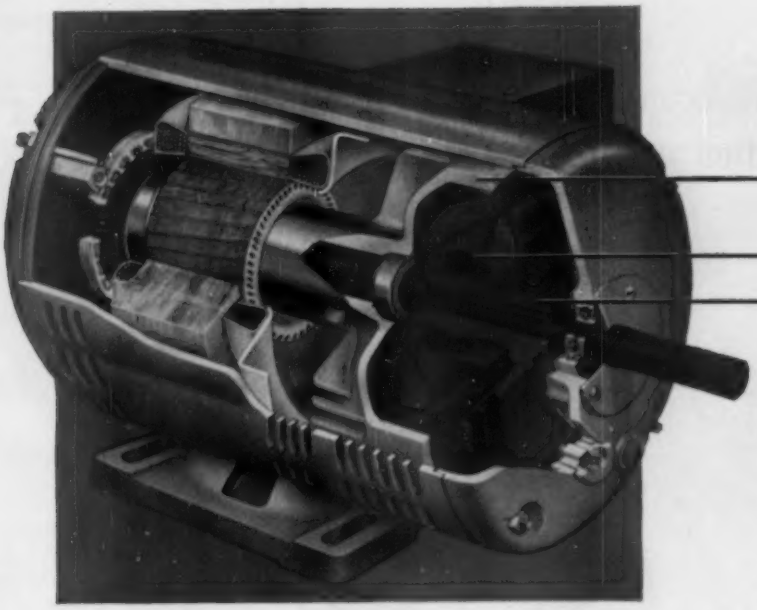


E—22—Pillow block has bronze precision liners that can be replaced easily and quickly. These new sleeve bearings are recommended for shock loads, high temperatures, corrosive conditions. Worn bushing or liner can be replaced without removing bottom half of housing from its support: Just remove cap of the block, lift shaft enough to permit lower half of liner to be loosened and slipped out, insert new liner and seat it by tapping it lightly. Rotation of liner with shaft is prevented by brass retainer spool recessed between cap and base of housing. **Dodge Mfg. Corp.**

E—23—Variable-pitch sheaves are spring-loaded or manually-controlled. Designed for ⅓- to 2-hp. drives, the sheaves can be used on most single V-belt drives. Adjustable motor base is used with sheaves to position motor so advantage can be taken of speed variations. **Browning Mfg. Co.**

E—24—Rub tester determines rub coefficient of fibers. Device consists of horizontal cylinder, set of weights, and torsional scale. Fibers are laid over cylinder and attached to measuring lever and to weights. These fibers are rubbed over other fibers. **Metrimpex.**

. . . *Turn the page*



Get Stepless Adjustable Speed from AC Power

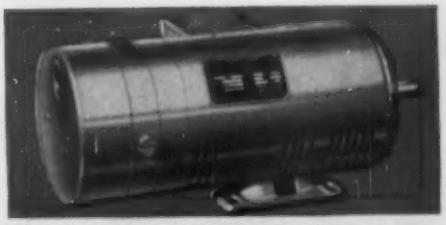
with DYNAMATIC Fractional HP Ajusto-Spede® Drives

Wherever infinite adjustment and accurate control of speeds are required, Eaton-Dynamatic Ajusto-Spede Drives offer a simple, low-cost solution to the problem—stepless adjustment from zero to full output speed, and accurate control of any speed within the speed range.

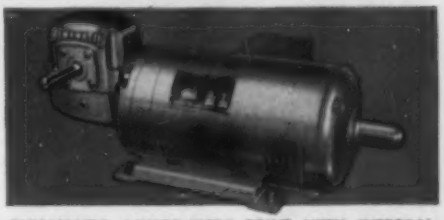
The Dynamatic Ajusto-Spede Drive is an integral combination of AC constant speed induction motor, eddy-current coupling, and plug-in type single-tube electronic control. Torque developed in the motor is transmitted to the driven member by electro-magnetic attraction; there is no mechanical contact between the driving and driven members.

Dynamatic Ajusto-Spede Drives operate on standard 115/230 volt, single phase, 60 cycle or 220/440 volt, 3 phase, 60 cycle alternating current—no special power source is required. Sizes are ¼, ½, and ¾ horsepower at 1600 RPM; ½, ¾, and 1 horsepower at 3200 RPM.

With standard, special, or remotely mounted transistorized control, Dynamatic Ajusto-Spede Drives offer many worthwhile advantages not found in other methods of speed control. Send for illustrated descriptive literature.



DYNAMATIC AJUSTO-SPEDE DRIVE WITH ELECTRICALLY OPERATED BRAKE. With the safety type friction brake, it is possible to achieve rapid deceleration and quick stop, thus providing fast cycling operation.



DYNAMATIC AJUSTO-SPEDE DRIVE WITH INTEGRAL SPEED REDUCER. Because of the variety of gear ratios available in the reducer, this compact assembly is adaptable to a wide range of slow speed applications.

EATON

DYNAMATIC DIVISION
MANUFACTURING COMPANY
3122 FOURTEENTH AVENUE • KENOSHA, WISCONSIN

ORIGINATORS OF EDDY-CURRENT SPEED CONTROL EQUIPMENT

CIRCLE 135 ON READER SERVICE CARD 135

QUESTION...

How do you stack up... in yarn production and quality?

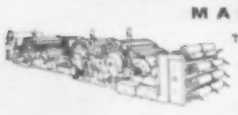
Investigate now and find out:

1. How your present figures compare.
2. How your present equipment advantages and features compare.
3. How D&F supplies can help.
4. How to conduct your own mill survey.
5. How to arrange for a D&F Survey .
6. How to achieve "Coordinated Production" through services of D&F Sales Engineers and Technicians.

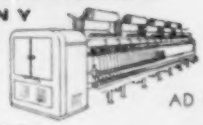
ANSWER...

Work hand-in-hand With "Coordinated Production" in the woolen system.

DAVIS & FURBER
MACHINE COMPANY



TEXTILE MACHINERY DESIGNERS AND MANUFACTURERS
North Andover, Mass.
Charlotte, North Carolina



AD 14-5

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SPARE PARTS • TECHNICAL SERVICE & CONSULTATION

Equipment and Supply News

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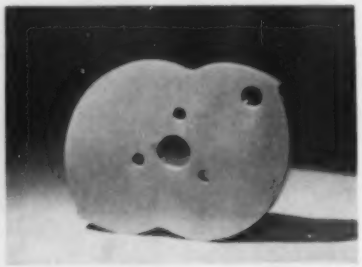
For more information on any of these items, circle appropriate number on the Reader-Service Card, which appears inside the back cover.

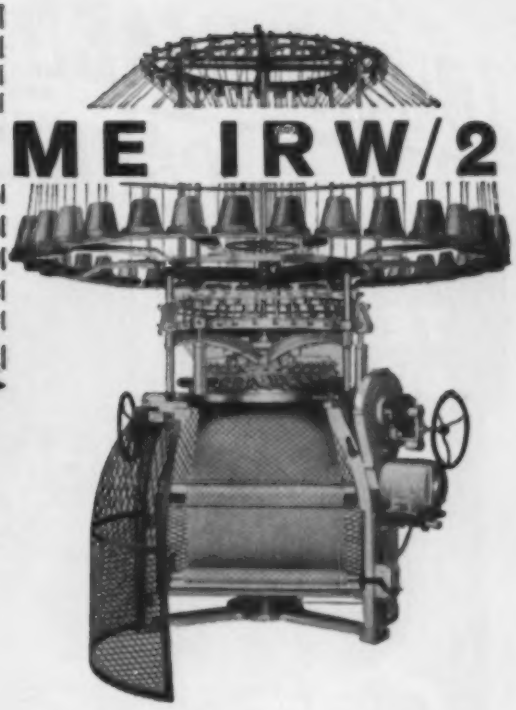


E—25—Filling cam means higher speed on spoolers. May be used on conventional or Gwaltney-design spinning frames. Changes traverse rate so that helix angle of yard laid on bobbin taper is constant (i.e., uniform spacing of yarn on bobbin). Built-in rate of acceleration prevents dwell at shoulder or bottom of stroke, thus eliminates bunching of yarn on bobbin. With this improvement, proper tension is maintained and sloughing-off is prevented during high-speed spinning. Cam gives good results where spooler speeds run as high as 1,000 to 1,200 yd. per minute. **Saco-Lowell Shops.**

E—26—Liquid filter is small, compact, designed for process and industrial water, brine solutions, demineralized water, and a wide range of process fluids. Especially suitable for pilot-plant or development work. Filter elements available with Adams Poro-Stone, Poro-Carbon, Micro-Maze (sintered metal), or Poro-Edge. Package is low-cost. **R. P. Adams Co., Inc.**

. . . Turn the page

NEW SUPREME IRW/2



Puts You 50% AHEAD OF TODAY'S PATTERNED RIB INTERLOCK FIELD

- **36 feeds—50% Greater Production Than Any Present Machine**
- **50% Greater Pattern Area Than Previously Possible**
- **Unsurpassed Versatility**

Supreme's model IRW/2 knits *up to 42 yards per hour* of patterned or plain rib and interlock yard goods for outerwear and bathing suits.

Its 36 feeds give the knitter a tremendous advantage over existing machines in output and pattern area. All feeds are equipped with extra large pattern wheels (up to 6" diameter wheels supplied as standard equipment with larger diameters available optionally). The IRW/2 is 30" in diameter and available in cuts up through 16 per inch.

DUAL RACEWAY GIVES VAST SCOPE OF PATTERNS & TEXTURES FOR OUTERWEAR

The dial has a dual raceway for rib or interlock production. The needles of either raceway may be set in knit to tuck or knit to welt positioning — providing a sweeping range of patterns and textured rib or interlock production.

Supreme's new feeding rollers for accurate and positive control of rubber yarns are available as optional equipment . . . providing an extra advantage for bathing suit fabric producers.

Has Supreme's Standard, Mill-Proven Features including revolving cylinder — stationary yarn stand — rugged, dogless construction, etc.

Write for free booklet on this important advance in the interlock field.

SUPREME
KNITTING MACHINE CO., INC.
94-02 104th STREET, OZONE PARK 16, N. Y.

Where RELIABILITY COUNTS MOST

—on TEXTILE DRY CANS

Patent No. 2,836,439

—*North Carolina Mill Installs*

BARCO TYPE C *Rotary* JOINTS

- **RESISTS SEAL RING BREAKAGE**—The spherical seal ring is under compression, not tension, loading. Self-adjusting for wear. Seal withstands shock loads and alternating hot and cold service.
- **WIDE SPACED BEARINGS**—Two, instead of one . . . increased bearing area. No lubrication required. Lowest friction.
- **200 P.S.I. STEAM RATING**—Heavy duty service at no extra cost. Eight sizes, ½" to 3".

SEND FOR CATALOG 510

FOUNDED 1926
BARCO
PRODUCTS BACKED BY EXPERIENCE

TODAY there is a better rotary joint for dry can and textile machine service. Barco's *Type C* joints give mills the kind of performance needed for efficient operation of new machines, as well as modernization of older machines.

The installation shown above is in a well-known North Carolina mill where this dry can range is one of the many now completely Barco equipped. 1" *Type C* joints handle steam supply and syphon drainage. This installation is the direct result of a thorough comparative test of the Barco *Type C* joint. *After more than three years, the first joint installed has continued to work perfectly with no attention, maintenance, or repairs!*

Barco joints are available from LOCAL STOCKS throughout the country. Standard series joints handle all steam pressures to 200 psi—one basic style for all services, single flow or syphon flow. ½", ¾", and 1" sizes are now furnished with bearing bronze sleeve and end cap for increased life and corrosion resistance—*guards against sticking when left idle.* ASK FOR INFORMATION.

BARCO MANUFACTURING CO.
5340 Hough Street, Barrington, Illinois
The Only Truly Complete Line of Flexible Ball, Swivel, Swing and Rotary Joints
In Canada: The Holden Co., Ltd., Montreal

Equipment and Supply News

. . . *Begins on page* 127

For more information on any of these items, circle appropriate number on the Reader-Service Card, which appears inside the back cover.

E—27—Industrial platform truck, with sealed-bearing heavy-duty casers and heavy-gage-steel caster fork, gives increased load capacity with no increase in wheel size. Casters have neoprene seals to protect swivel and wheel bearings from water, dirt, and detergents. Four replaceable 1-in. rubber-tired wheels have a total capacity of 2,400 lb. **Colson Corp.**

E—28—Extractor made of stainless steel is designed for textile applications. Diameter, 48 in. High capacity, heavy duty. Unit has automatic air braking, with fingertip timing control on the balancing stand. Curb, curb cover, and basket are stainless steel. **Fletcher Div., Sharples Co.**

E—29—All-static motor starter, called Static Slipsyn, can be used on low- and high-voltage synchronous motor starting equipment. It applies with sealed-bearing heavy-duty cast-tomatic air braking, with fingertip motor-field excitation at proper speed and most favorable rotor and stator relationship, detects and removes excitation if the motor pulls out of synchronism, and protects starter or damper winding from overheating. Power from the a-c supply. **Westinghouse Electric Corp.**

E—30—Hydraulic gear pumps come in five series with four displacement variations per series. Capacities, from 0.7 to 140 gpm. at 2,000 rpm. and 2,000 psi. Features: tin-aluminum bearings, double-lip shaft seal, steel gears and shafts, high-tensile aluminum bodies. **Wooster Div., Borg-Warner Corp.**

. . . *Turn the page*

91 YEARS

of making the

"VERYBEST"

LOOM

NECESSITIES

JACOBS

SINCE 1869

THE BULLARD CLARK COMPANY

JACOBS

SOUTHERN DIVISION — Charlotte, N. C.

NORTHERN DIVISION — Danielson, Conn.

CIRCLE 253 ON READER SERVICE CARD

AS FAR AS THE EYE CAN SEE...

More Production, Greater Profits with the LONG* Pneumatic Lap Control System

Over 400 installations emphasize that mills prefer the LONG System. They have proven that the LONG System produces longer and heavier laps, increases picker production through longer running time between doffs, delivers quality laps from both cotton and synthetic fibers with maximum safety. Only the LONG System is devised to deliver uniform pressure on laps building up on calendar stack rolls, from start-up to doffing. Equip your existing pickers with the LONG System. Send today for complete details and illustrated brochure.

*Patent No. 2,871,519
Other U. S. and Foreign Patents Pending

Installation of complete LONG Lap Control System on 17 pickers in one of the largest picker rooms in the South. Pickers shown in the foreground are 1913 model Kitsons.

LIVINGSTON & HAVEN, Inc.

P. O. BOX 808-T • • • CHARLESTON, S. C.

Representatives in all major world textile areas. Address foreign inquiries to Platt Bros. (Sales) Ltd., Oldham, England

. . . *Begins on page* 127

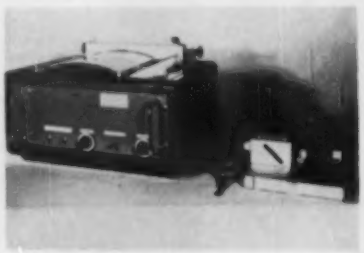
For more information on any of these items, circle appropriate number on the Reader-Service Card, which appears inside the back cover.

E—31—Miniature colorimeter, called Procolor, is Swiss product. Easy to operate, easy to handle, yet fairly precise. Balanced six-transistor amplifier, continuously operated, gives maximum stability. Metallic sample holder suppresses stray lighting that might affect reading. Size of instrument: 6½x4x2½ in. To operate, insert standard sample in 0 position, adjust meter to 0 reading. Then insert standard sample in 100 position, adjust meter to 100 reading. Finally, insert test sample, read percent transmission from meter. **Manufacture Pyror S. A.**

E—32—Scrubber-vacuum is battery-powered, comes in two models, is designed for heavy-duty floor maintenance, will clean up to 21,600 sq. ft. of floor per hour. Machine is powered by four 6-v., 25-plate batteries with 6- to 8-hr. life. Compact battery charger is included as standard equipment. Both models have 17-gal. solution-dispenser tank and 19-gal. pickup tank. **Finnell Systems, Inc.**

E—33—Moisture meter, Model RC4, is designed to measure the moisture content of wide variety of textile materials. The instrument can be used to check material in storage or in process. Testing takes less than 1 min., and there is no loss of material. **Delmhorst Instrument Co.**

E—34—Hydraulic dockboard, with 10,500-lb. wheel load rated capacity, saves time and space in loading and unloading trucks. Air-operated, board requires no electricity. Can be lowered or raised quickly by an "up-down" valve. Board is 57x60 in. **Freightliner Corp.**



E—35—Fiber-diagram machine makes diagram from top of wool or almost any other natural or man-made fiber. Device contains two units: sealer (above), in which sample is sealed to plastic tape; and diagramer, which measures fibers. To operate: With metal grip remove representative draw from sample, align ends, seal draw to strip. Then traverse draw between electrodes of diagramer, which will show amount of fiber at various distances from aligned ends. Machine closely approximates results of hand stapling and single-fiber measuring instruments. **Stellamcor, Inc.**

E—36—Fibrous bonding resins of vinyl and styrene are suggested as binders for nonwoven fabrics, paper laminates, and reinforcement of glass-fiber mats and asbestos sheets. Resin particles vary in length from very short to $\frac{3}{16}$ in. **Union Carbide Plastics Co.**

. . . *Turn the page*

REZOSOL binders pay off here

Loom pick counters tell the Rezosol story best. Houghton's new polymer binder for sizing spun blends containing the newer synthetics pays off in *increased* production. Rezosol improves weaving efficiency . . . reduces shedding . . . lowers kettle costs . . . reduces seconds . . . makes mixing easier.

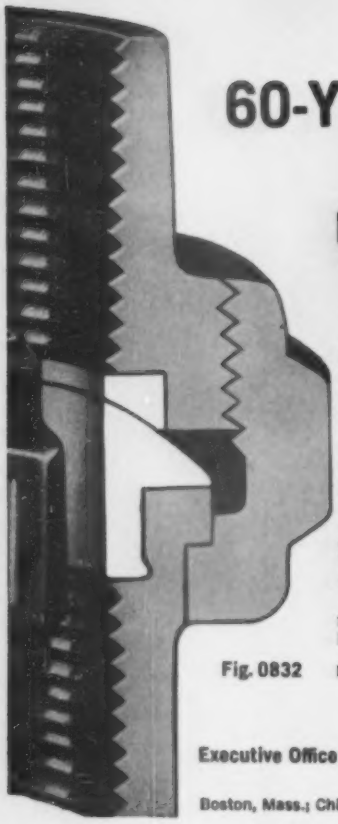
Rezosol is added to the starch to improve its adhesion to yarn. It is remarkable, say users, how a little does such a lot of good in providing better weavability.

For details on Rezosol products—new members of the Houghton textile processing family—write E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa. or Carrollton, Georgia.

Industry's Partner in Production

E. F. HOUGHTON & CO.

Philadelphia, Pa. • Chicago, Ill. • Carrollton, Ga. Detroit, Mich. • San Francisco, Calif. • Toronto, Canada



60-Year Guarantee Backs Dart Unions

For over 60 years every Dart Union has been backed by the firm GUARANTEE that "if one should leak through, we will give you two". Less than 1 in every 100,000 has proven faulty.

The extra wide bronze seats, ground on specially designed machines to a true ball and socket joint, are swaged under heavy pressure into air-refined malleable iron bodies. They come apart readily and remake repeatedly without excessive wrenching — without jamming. They are the reason that Darts may be used over and over again.

Sizes: ⅛" thru 4 inches
Pressure ratings: ⅛"-2"— 300 S.W.P., 600 W.O.G.
2½"-4"— 250 S.W.P., 600 W.O.G.

Fig. 0832 Darts also available in the all-iron construction.

THE **Fairbanks** COMPANY
Executive Office: 393 Lafayette Street, New York 3, New York
Branch Offices:
Boston, Mass.; Chicago, Ill.; New York, N.Y.; Pittsburgh, Pa.; Rome, Ga.

CIRCLE 254 ON READER SERVICE CARD

James Lees and Sons Company

has been acquired by

Burlington Industries, Inc.

Negotiations leading to this transaction were conducted by the undersigned.

Kidder, Peabody & Co.
Incorporated

April 13, 1960.

Equipment and Supply News

. . . Begins on page 127

For more information on any of these items, circle appropriate number on the Reader-Service Card, which appears inside the back cover.

E—37—Set screw, self-tapping, solves problem of tapping in many metals and plastics. Screw pulls self in, gathers metal and plastic chips into oversize flutes. Sizes poorly tapped holes, taps into paint-filled holes, also does routine tapping jobs. **Set Screw & Mfg. Co.**

E—38—Right-angle-bracket nut resists push-out, twist-out, vibration, and shock. The bracket is lightweight and is made of cadmium-plated, heat-treated carbon steel for temperatures up to 550° F. Furnished with or without dry-film lubricant. **Elastic Stop Nut Corp. of America.**

E—39—Plastic conveyor belting, called Permagloss, is based on Mylar and vinyl. The belting is economical and is highly resistant to tearing, stains, and most oils, solvents, and alkalis. The material is flexible, will not stretch, and is easily cleaned. **Lassiter Corp.**

E—40—Compact bolt threader, No. 101, is designed for fast and easy bolt threading. Only one die head needed for 10 different bolt-die sizes ranging from ¼ to 1 in. Loosening locking lever gives quick accurate setting of size bar for standard, oversize, or undersize thread. **Ridge Tool Co.**

E—41—Laboratory tubing of clear vinyl for general purposes is flexible at low temperatures and can be used with a wide range of chemicals. The transparency of the tubing is an aid in installations that have to be cleaned or flushed out in situ. **Fisher Scientific Co.**

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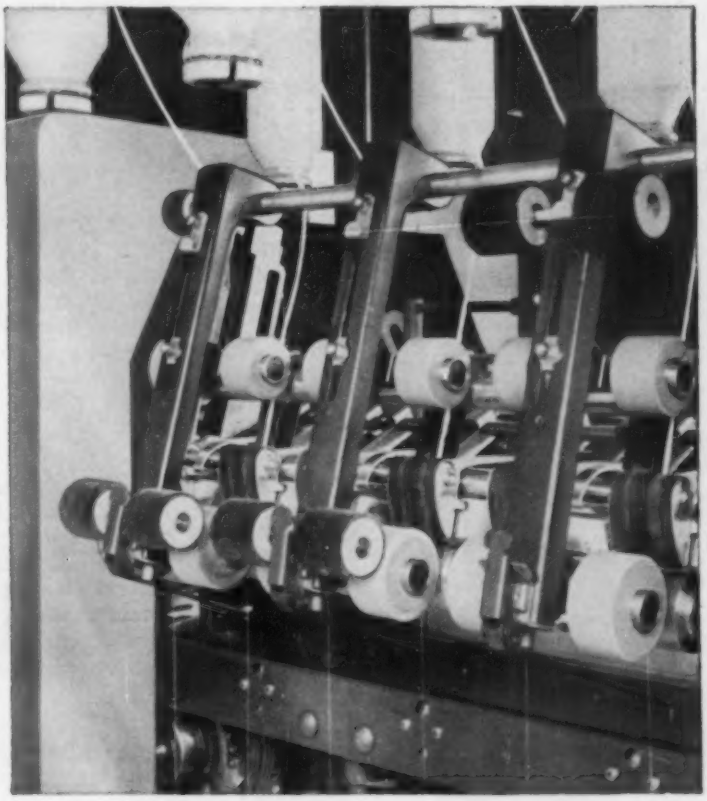
THE MOST VERSATILE AND FLEXIBLE SYSTEM EVER DEVELOPED

long staple spinning

by Saco-Lowell

All ways FIRST with the newest



FOR WORSTEDS SYNTHETICS AND BLENDS

This new spinning system offers mills the opportunity to substantially improve quality and greatly reduce production costs. Designed to process worsteds, synthetics and blends in staple lengths from 1.5" to 9" indicating flexibility and versatility never before obtainable. In addition, increased drafts, as much as 50%, with a marked improvement in quality are possible. Complete anti-friction design cuts lubrication time by two-thirds or more, eliminates dirt and lint collecting oil film resulting in reduced maintenance costs.

Long staple drafting is available on the new SJ chassis, improved conventional chassis or as a changeover. This versatile drafting system is also available for roving.

THE STANDARD OF QUALITY AND PERFORMANCE Since 1813

Saco-Lowell Textile Machinery Division

SACO-LOWELL SHOPS

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Branch Sales Offices: ATLANTA, GA., CHARLOTTE & GREENSBORO, N. C., GREENVILLE, S. C., SACO, ME.

SEAMLESS!
SNAG-FREE!

Now you can get Diamond Fibre Roving Cans in the big 16" and 18" diameters from regular stock at the Spartanburg plant-warehouse.

Static-free rolled fibre top rim for running synthetics; one-piece steel top rim; or swedged top rim—these meet all roving requirements.

CDF Diamond Fibre Roving Cans are smooth, strong, long-lived. Their interior surface, like porcelain, resists cracking and softening—won't snag yarns.

Make the CDF Spartanburg warehouse (834 Hayne Street, Spartanburg, S.C.—Tel. 3-6397) your headquarters for fibre and Celoron loom parts, gears, trucks, and mill boxes. Call Spartanburg or write for CDF Receptacles Catalog.

CDF CONTINENTAL-DIAMOND FIBRE
A Subsidiary of The Budd Company
Newark 35, Del.

Equipment & Supply News

. . . *Begins on page* 127

For more information on any of these items, circle appropriate number on the Reader-Service Card, which appears inside the back cover.

E—41—Electric fork truck with 4,000-lb. capacity, called the EC-40, is a cushioned-tire, rider-type truck with carbon-pile drive control. The power plant, easily accessible, can pull a fully loaded truck up a 10% grade. Top speed: 6.2 mph. Turning radius: 70 in. **Clark Equipment Co.**

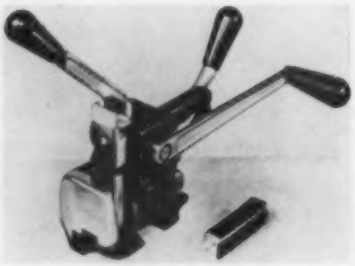
E—42—Metering pump, marketed as Matriflow, is available in four standard sizes that handle a maximum of 10, 18, 36, or 54 gal. per hr. and can be adjusted to meter any amount within their respective ranges. The pumps will handle slurries and viscous liquids at up to 300 psi. **Madden Corp.**

E—43—Moisture tester, fitted with two transistors and one electronic tube, has an indicating range from 0.3 to 25%. One model has two needle-like electrodes that can be inserted into wound yarn. A second model is equipped with plates for measuring moisture in cloth. **Metrimpex.**

E—44—Urethane adhesive, called Bostik 7070, has high resistance to oils and solvents and a strong elastic bond. Applicable on natural and man-made-fiber fabrics, leather, nylon, and other plastics. Cures at room temperature. Colorless. No residual odor. **B. B. Chemical Co.**

E—45—Remote air-conditioning systems are available in 10- and 15-ton capacities. Each unit has twin compressor system, matching coil and fan. Built-in time-delay relay permits step starting. Condenser coils are on each side of outdoor component. **Westinghouse Electric Corp.**

E—46—Urea fume control in textile operations is provided by Formol 11-X, which reduces intensity of fumes by chemical change. Application: Spray a 1 to 1½% water dilution into the fume exhaust duct system or into the process area. Spray should be fine as possible. **Rhodia, Inc.**



E—47—Strapping tool (Model 2302) combines tensioning, automatic placement of seals, sealing, and scoring of steel strapping. Tool handles ½- and ⅝-in. strapping in gages of 0.015 to 0.023 in., holds 50 seals in a clip-type magazine. It feeds the seals automatically to the tensioned strap. This way, one motion of the tool does two jobs: It crimps the seal and scores the strap for easy break-off. **A. J. Gerrard & Co.**

E—48—Epoxy sprayer, called Quik-Spray, applies coatings of epoxy resins to floors and walls, gives same thickness as a trowel. System is low-pressure, high-volume. Output up to 10 cu. ft. per min. Time savings are substantial —and so are labor savings. **Pennsalt Chemicals Corp.**

E—49—Flat-on-the-floor wiring is now possible with a new duct, called Electriduct, that eliminates hazards to people, vehicles, and electrical distribution system. Cross section is 2¾ in. wide and 3.8 in. deep at center. Wholly rubber-encased. **Ideas, Inc.**

E—50—Corrosion-resistant bearings for 1.9-in.-dia. conveyor rollers are offered in two types. In one type, an acetal-resin ring of Delrin (Du Pont-developed) replaces the steel balls in the bearings. The Delrin ring bearings make the aluminum conveyor rollers less noisy. Another type, for greater capacity load, is a stainless-steel bearing. **Rapids-Standards Co., Inc.**

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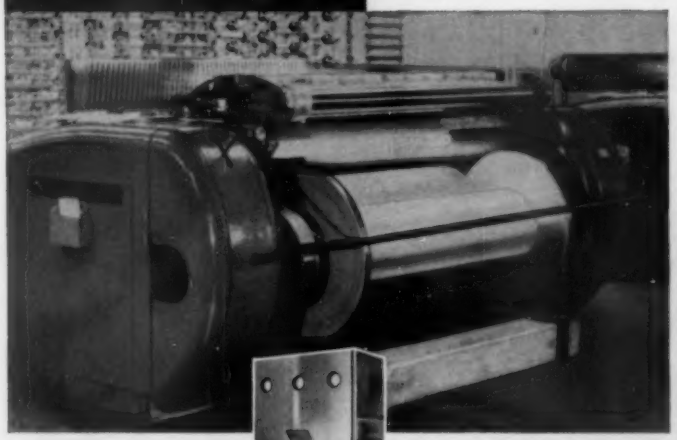
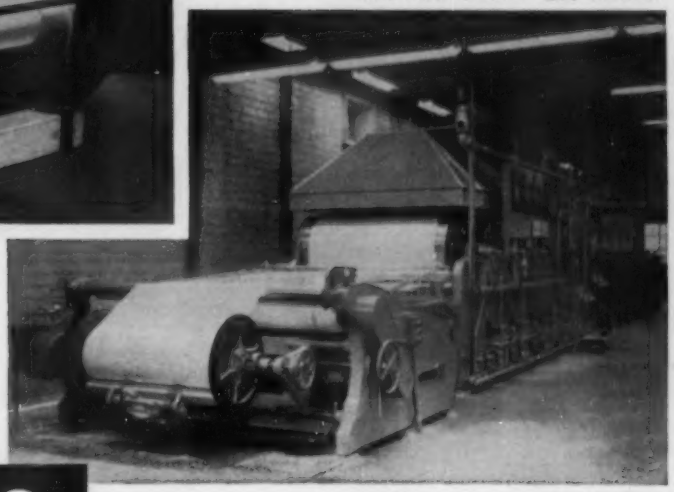


The Cocker **SD49** Warper and Creel

COCKER

The New Cocker **GH** Slasher



+ THIS

The Nemo Jet Cooker

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= The World's FINEST Warp Preparation

ONLY COCKER has had experience in all types of warp handling problems, and only Cocker produces all types of warp handling equipment. You get the finest warps in the world with a co-ordinated all-Cocker installation.

High Speed Rayon Warpers
Slow Speed Rayon Warpers
Slow Speed Cotton Warpers
Ball Warpers
Gas Warpers
Snake and Link Warpers
Vertical Cotton and Rayon Creels
Horizontal Cotton and Rayon Creels
Cheese and Spool Creels
Special Jute Creels
Nemo Jet Cooker
High Speed Cotton Slashers
High Speed Rayon Slashers
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CIRCLE 145 ON READER SERVICE CARD

WOOD'S POWER TRANSMISSION PRODUCT NEWS

REVOLUTIONARY NEW VARIABLE

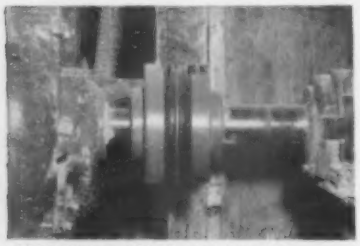
Revolutionary resilient cam follower construction of Wood's new "MCS" motion control, variable speed drives holds constant driven speeds under varying torque loads. Like the "MS," the "MCS" won't freeze or stick. Check oil only once or twice a year. Write for Bulletins 8102, 4101.

CIRCLE 255 ON READER SERVICE CARD

SIMPLE, EFFECTIVE, LOW COST

Wood's Card Drive offers all of the advantages of individual card drives without clutches or gear reducers to maintain. It is simple, smooth-starting and dependable . . . and costs less to buy, less to maintain. Write for Bulletin 6100.

CIRCLE 256 ON READER SERVICE CARD



4-WAY FLEX—UNIQUE DESIGN

Wood's Sure-Flex Couplings absorb 5 to 15 times more shock and vibration than other leading flexible couplings . . . swallow all types and combinations of angular and parallel misalignment, end-float. Simple, no wear, no lubrication. Low cost. Write for Bulletin 5103.

CIRCLE 257 ON READER SERVICE CARD

MPT/360A

Woods

T. B. WOOD'S SONS COMPANY

CHAMBERSBURG, PENNSYLVANIA

ATLANTA • CAMBRIDGE • CHICAGO
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Equipment and Supply News

For more information on any of these items, circle appropriate number on the Reader-Service Card, which appears inside the back cover.

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E—51—Pouring meter controls pouring rate of liquids from drum. Control can be set at rates from 1 drop per minute to 10 gallons per hour. Rate of flow remains constant from full drum to empty. Changeover from one drum to another is easy—no tools needed. **Sterling E. Norcross Co.**

E—52—Aluminum ladder is a 28-ft. two-stage model mounted on a self-supporting wheeled frame. Width is 2 ft., 6 in. Collapsed dimensions are 2 ft. 6 in. by 6 ft. 5 in. Easy to carry. Handy to have around the mill for repair and maintenance work. **Ballymore Co.**

E—53—Worm gear motors are available in a new line of 6-in. center-distance models. They come in 3-, 5-, 7½- and 10-hp. units with foot, ring, or shaft mounting. Motor housings for these models are made of heat-treated aluminum alloys. **Electra Motors, Inc.**

E—54—Resin adhesives line (Solu-Rez series of polyvinyl-acetate-resin adhesives) is now expanded to include three viscosities—220, 1,500, and 2,000 cps. Applications: sealing cartons and making folding boxes. Eary to remove from machine parts and reservoir. **Morningstar-Paisley, Inc.**

E—55—Hand pallet trucks in two new widths (17¾ and 33 in., the distance across both forks) have been added to manufacturer's line. Trucks have removable, leakproof, self-contained hydraulic system. No tubing, ducts, or interior packing. **Stokvis Multiton Corp.**

E—56—Motor base of low "pancake" type is designed for variable-speed sheave installations where space is at a premium. Adjusting screw releases rapidly. Base can be moved quickly, easily to shorten center-to-center distance for sheave adjustments. **T. B. Wood's Sons Co.**

E—57—Nameplate press is compact. It stamps letters and numbers (selected by dialing) on identification plates, toolroom and storage-bin tags, personnel badges, keys, and the like. Plates and tags then may be attached to property and equipment. **Identification Systems, Inc.**

E—58—Extension-wire cable for thermocouple calibrations is now available with multiple conductors. Polyvinyl-over-polyvinyl insulation. Maximum temperature, 221 F. Produced in 16- and 20-gauge wire, color-coded, in 4 to 48 pairs. **Brown Instruments Div., Minneapolis-Honeywell.**

E—59—Servo amplifier is a high-gain, thermo-electric type designed for applications requiring extreme sensitivity and stability. Especially suitable in self-balancing instruments of laboratory accuracy. Useful in industrial process-control systems. **Thermo Electric Co., Inc.**

E—60—Roller arm used with limit switches can be adjusted to any length between one and four inches. You can change the arm length by simply loosening the Allen head screw on the side of the arm and sliding the arm up or down to the position you want. Scale marked in ⅛-in. increments is on the side of the arm for varied can-track locations. Rollers are available in ⅝- and 1-in. dia. **Square D Co.**

. . . *Turn the page*

new Wood's selector charts simplify timing drive design

Now you can shelve the slide rule when you figure a timing belt drive installation. Engineers at T. B. Wood's Sons Company have developed a simplified design method that produces the right drive answers with almost no calculations.

This new method is contained in five easy-to-understand Selector Charts covering all timing belts from "extra light" to "double extra heavy." These new Selector Charts are a Wood's exclusive. For your free set, write for Bulletin 21103.

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T. B. WOOD'S SONS COMPANY · CHAMBERSBURG, PA. · ATLANTA · CAMBRIDGE · CHICAGO · CLEVELAND · DALLAS

POSITIVE, UNIFORM

YARN TENSION

CONTROL

with the NEW

FABRIONICS UNA-MAG

UNA-MAG GIVES YOU UNIFORM TENSION that means higher quality yarn in warping, spinning, winding, knitting, etc.

UNA-MAG DESIGN PERMITS INSTANT TENSION ADJUSTMENT to as much as 100 grams above the weight of the top disc. Tension can be adjusted on each yarn and separately or on more than 1,000 ends simultaneously by merely resetting a dial. Tension can also be varied to compensate for the varying distances the yarn travels.

UNA-MAG IS EASILY INSTALLED on any disc-type tension device and the simplicity of operation helps minimize yarn damage caused by roughened and worn contact surfaces.

UNA-MAG IS FLEXIBLE. When you shift from any size yarn or cord to any other size, you simply reset a dial on the Una-Mag to maintain constant tension.

UNA-MAG IS SELF CLEANING. The precision construction of the Una-Mag permits a continuous spinning action on the top disc which prevents the accumulation of grease, dirt, etc. This means fewer maintenance problems and less down time for cleaning or adjusting.

Fabrionics

Write for complete details on how FABRIONICS UNA-MAG'S uniform yarn tension control can save you time and increase your profits.

FABRIONICS CORPORATION
Box 521 · Huntington, L.I., N.Y.

Equipment & Supply News

Begins on page 127

For more information on any of these items, circle appropriate number on the Reader-Service Card, which appears inside the back cover.

E—61—Bellows meter with 6-in. indicating dial is designed for flow and liquid-level measurements that do not require recording or transmission. Available in 15 ranges from 0-20 to 0-400 in. of water. Range changed by changing spring assemblies. **Brown Instrument Div., Minneapolis-Honeywell.**

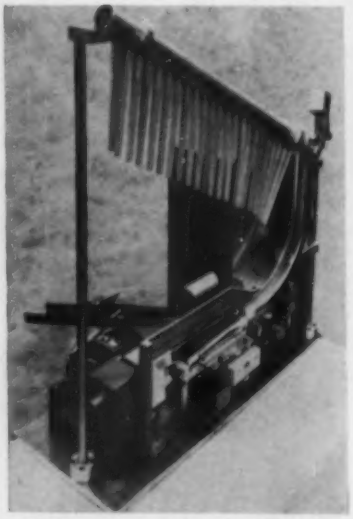
E—62—Ventilator-skylight, called Lite-'n-Aire Heat Valve, is a combination ventilator and skylight. Gravity design incorporates special Fiberglas components to provide diffused natural light whether ventilator damper is open or closed. **Swarthout Fabricators, Inc.**

E—63—Storage tank made of molded polyethylene has 500-gal. capacity. Permanent corrosion resistance is built in. Tank is available in several styles: full open head, closed head with openings, flat or conical bottoms. Fittings available in wide range. **Delaware Barrel & Drum Co.**

E—64—Lift trucks of high capacity are now available in two new 22,000-lb. gas-powered models (24- and 27-in. load centers respectively) with cushion tires. Length: 125¼ in. from face to fork carriage to rear of counterweight. Turning radii: 110 and 122 in. **Yale & Towne Mfg. Co.**

E—65—Vacuum gages are battery operated and transistorized. Available in ranges from 0 to 1,000 microns of mercury and from 0 to 20 millimeters of mercury. Portable or panel-mounted models. Features: accuracy, direct reading, matched interchangeable tubes. **Hastings-Raydist, Inc.**

E—66—Potted limit switches, with all foreign solids and liquids removed, can be used where large quantities of oil and coolant are present. Manufacturer's small precision and heavy-duty limit switches can be furnished in new design. Leads available in lengths as desired. **Square D Co.**



E—67—Quill checker, called Quil-Chek, automatically passes or rejects quills according to run-out. Device handles quills ranging from 7⅜ to 9½ in. at rate of 60 per minute. May be fed from existing lines, from hopper, or from special systems. **Custom Scientific Instruments, Inc.**

E—68—Dust filter of improved design ("RJ") has only three moving parts. It filters and recovers dust whether airstream is heavily or lightly loaded, whether particles are fine or coarse, abrasive or nonabrasive. Filtering medium is designed to maintain its porosity. **Day Co.**

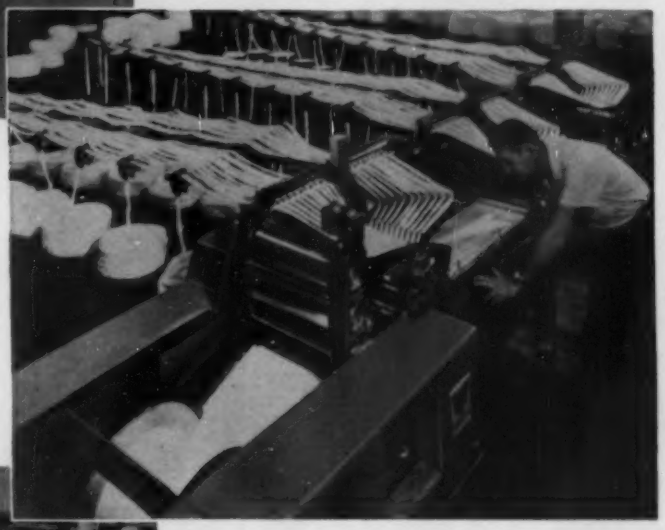
E—69—Dehumidifying System is especially designed for industries that process hygroscopic materials. No ductwork needed, so installation and operating costs are low. Manufacturer custom-builds systems to meet the requirements of individual purchasers. **Air-Perme-Ator Mfg. Co.**

E—70—Filling holder and cutter, a new mill-tested product, is called the Series 8300 Cutter. It can accommodate, without any adjustment, all types and sizes of filling (cotton, rayon, wool, glass fiber, and others). The hardened-steel gripper holds filling firmly and in straight line. **H. F. Livermore Corp.**

. . . Turn the page

the WHITIN way to BETTER COMBING

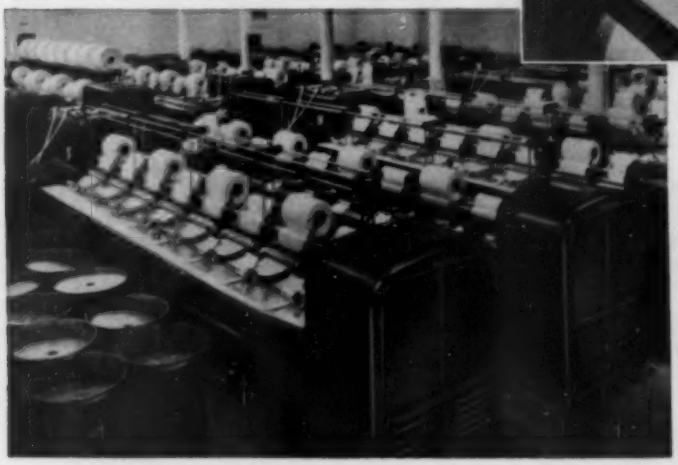
The Whitin combing process is gaining rapid recognition as a major advance in the manufacturing of combed yarns. Scores of mill customers are reporting the increased production of higher quality sliver. Manufacturing costs are low and its simplicity of construction adds to its efficiency and ease of maintenance.



The Whitin Even-Draft Drawing Frame is unexcelled for drawing either before or after combing. Sliver of uniform quality is produced at speeds of 450† F.P.M. It also features a proven pneumatic waste removal system.

†Up to 600 F.P.M. carded.

Laps are formed on the new Super Lap machine. It drafts 48 - 60 ends at up to 800* lbs. per hour, forming a lap ideal for combing.



The Whitin Super J Comber has established an international reputation for fine performance. It is capable of producing up to 60* lbs. per hour. High nep removal ratio, excellent sliver quality and accurate waste control contribute to better yarns than ever being spun from given cotton grades. Its performance is equally outstanding on either super quality or production combing.

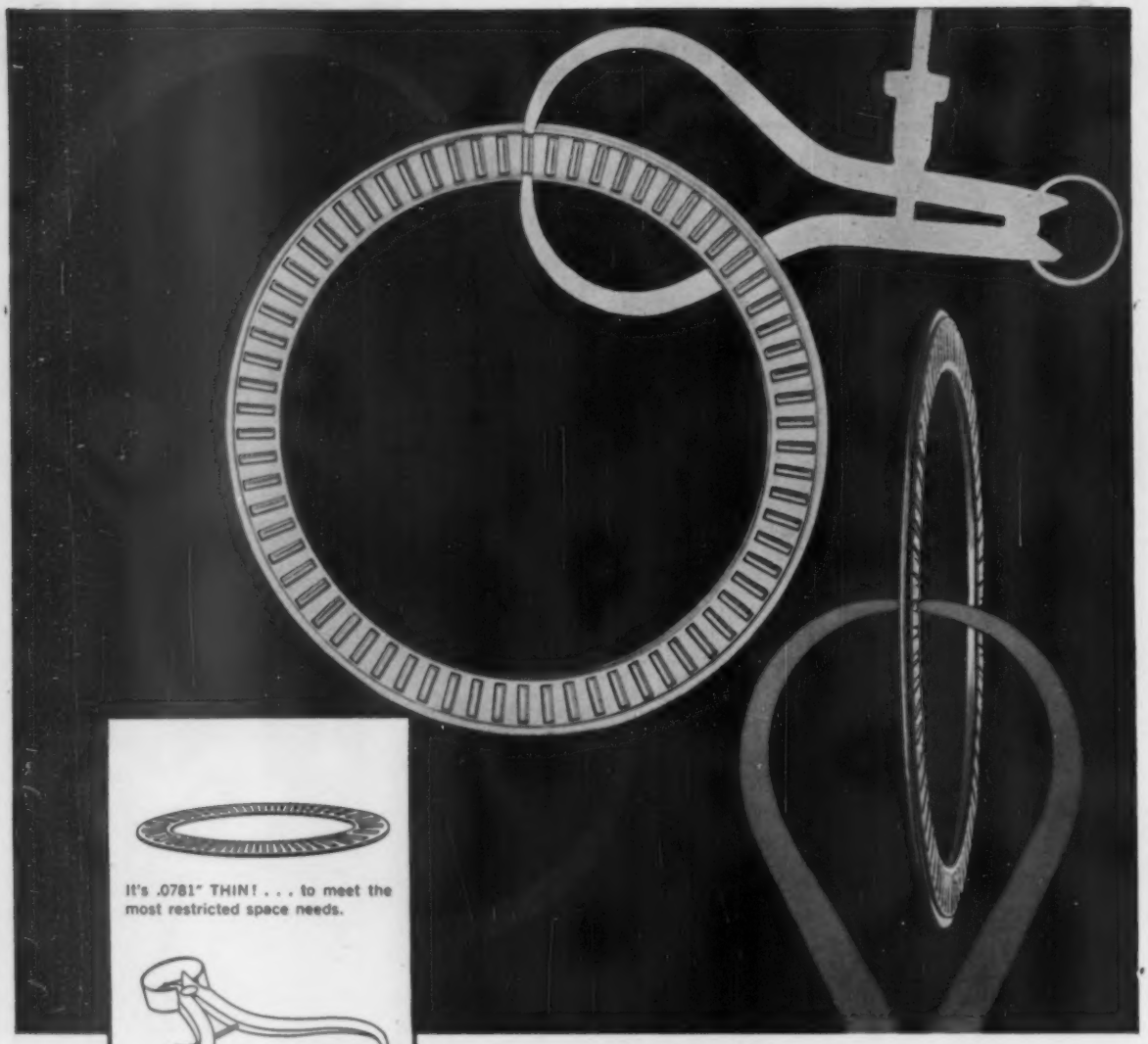
*100% efficiency.

Sales agents in all principal textile centers

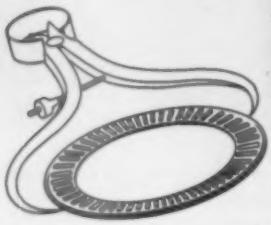
WHITIN MACHINE WORKS

WHITINSVILLE • MASSACHUSETTS, U.S.A.

CHARLOTTE, N. C. • GREENSBORO, N. C. • ATLANTA, GA. • SPARTANBURG, S. C. • DEXTER, ME.



It's .0781" THIN! . . . to meet the most restricted space needs.



OD is much smaller, for given shaft size, than other types of thrust bearings.

Needle-proportioned rollers provide large contact area in minimum cross section.

By Every Measure . . . Ideal For Compact Thrust Applications

Whether you gauge its value in compactness, high anti-friction efficiency, high thrust capacity, or low unit cost, you will find the new Torrington Needle Thrust Bearing measures up ideally to your needs.

This needle-type bearing is designed specifically for thrust loads in restricted space. It may run directly on adjacent hardened and ground surfaces or on standard thrust races. Used alone, or in combination with Torrington radial type Needle Bearings, the Needle Thrust Bearing finds wide use in many applications including steering gears, hydraulic pumps, tractor bolsters, bevel and worm gear boxes, governors, outboard motors, 2-cycle engines, washing machines, power tools, torque converters, and automatic transmissions.

For engineering information and assistance in design, please call upon the services of Torrington's Engineering Department.

progress through precision **TORRINGTON BEARINGS**

THE TORRINGTON COMPANY Torrington, Conn. • South Bend 21, Indiana

Equipment & Supply News

For more information on any of these items, circle appropriate number on the Reader-Service Card, which appears inside the back cover.

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E—71—Label applicator automatically affixes labels or tickets to sealed polyethylene packages on conveyors. Called Amscomatic 300, unit handles blank or preprinted labels 1 to 4 in. wide, 1.2 to 1⅞ in. high, will operate alone or in tandem with a printing machine. **Amsco Packaging Machinery, Inc.**

EQUIPMENT BRIEFS

E—72—Gravity conveyor can be extended from less than 11 ft. up to 30 ft. maximum. **The Rapids Standard Co.**

E—73—Leakproof pump weighs less than 7 lb. but can pump over 800 gph. Very compact. **Fostoria Corp.**

E—74—Track switch for power-and-free conveyors is electronically or manually controlled. **Chainveyor Corp.**

E—75—Shock-absorber door is opened by an air-powered ramrod, then returns to tight closure. **Clark Door Co.**

E—76—Looper machine attaches elastic to undergarments, has sealed bearings. **Willcox & Gibbs Sewing Machine Co.**

E—77—Damping attachment for limit switch eliminates contact transfer and telegraphing. **Square D Co.**

E—78—Load grab with side shift and multipurpose arms handles almost any nonpalletized load. **Lewis-Shepard.**

E—79—Sewing-machine light throws beam on needle area, supplements mill lighting. **Singer Sewing Machine Co.**

E—80—Belt conveyors provide interfloor movement or serve as boosters in gravity system. **E. W. Buschman Co.**

Textile World | NEW LITERATURE

For more information on any of these items, circle appropriate number on the Reader-Service Card, which appears inside the back cover.

TEXTILE MACHINERY & AUXILIARY EQUIPMENT

Custom-built elastomers—New six-page bulletin lists what new production idea can be boosted by use of any of 10 major elastomers. Bulletin No. 902, Lord Mfg. Co. **(L-1)**

Power-transmission belting—New catalog provides fast run-down on various types of industrial belting in its 24 pages. Describes features and adaptablility of major kinds of belting. Catalog B-60, Maurey Mfg. Co. **(L-2)**

Drying equipment—Catalog describes conveyor dryers, spray dryers, tray dryers, and truck dryers, along with description of continuous drying systems for mill use. 16-page, 4-color booklet No. 448 available from Proctor & Schwartz, Inc. **(L-3)**

"Motor Couplings"—Is title of new folder 2875 describing recently added features on geared flexible motor coupling line. Link-Belt Co. **(L-4)**

Tension and torque control—Six-page brochure tells of control units for webs and filaments, automatic edgeguide installations, electric or pneumatic eye controls. Web Controls Corp. **(L-5)**

Variable-pitch sheaves — Both spring-loaded and manually controlled sheaves and motor bases are described in catalog SL-101-A. Gives complete information for applications in ⅛ to 2-hp. range. Browning Mfg. Co. **(L-6)**

Roller bearings—In cylindrical form feature "Super Finish" rollers and raceways. Details are available

. . . *turn to page* 153

What method saves you **17%** of steel strapping?

See page 12

CIRCLE 258 ON READER SERVICE CARD

Out Goes LINT · FLY TRASH *from your* **SPINNING FRAMES and ROVING FRAMES** *Quickly • Economically*

by using

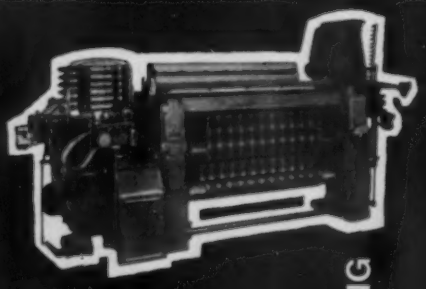
M-B AMOSKEAG PNEUMATIC ROLL PICKER

New, Improved MODEL 59

A pneumatic tool especially designed for the specific purpose of REMOVING LINT and FLY from the top rolls of Spinning Frames and Roving Frames. Saves time and does a better job by substituting mechanical cleaning instead of laborious hand methods. Air deflector prevents fly and lint being blown into yarn when spinning. Adjustable valve permits any desired spindle speed.

Write for Literature

M-B PRODUCTS
46 VICTOR AVE., Div. 16
DETROIT 3, MICHIGAN



SWISS TOP ENGINEERING

6 Shuttle

FULLY
AUTOMATIC
LOOM

SAURER

ADOLPH SAURER LTD.
ARBON / SWITZERLAND

in new Bulletin No. 114, just announced by Hoover Ball & Bearing Co. **(L-7)**

Fiber, leaf feeds—Bulletin No. 449 describes electrically driven inclined apron plus storage reservoir designed to open and fluff matted, packed, or lumped material gently, with even mixing and feeding. Full details available from Proctor & Schwartz, Inc. **(L-8)**

Polyphase motors—That are drip-proof, and totally-enclosed in squirrel-cage jackets, are featured in Bulletin MU-244 that uses cut-away photo to explain electrical, mechanical motor features. Wagner Electric Corp. **(L-9)**

Motorized valves—New reversible, proportional unit with instant braking feature is highlighted in new catalog No. 407 from Schade Valve Mfg. Co. **(L-10)**

Magnetic starters—8-page bulletin shows full range of sizes designed for fast and easy maintenance. Information on heavy current loads, severe arcing conditions included. Publication No. PL 12-8-160. Clark Controller Co. **(L-11)**

CHEMICALS & SUPPLIES

Rubber compounding—Full-color brochure explains how compounds and molds of natural and synthetic rubber meet close specifications for industrial rubber components. Booklet 3M-1771A-160, Colonial Rubber Co. **(L-12)**

Chemical film guide—Revised edition of catalog lists 182 titles, alphabetical and subject indexes of chemical subjects that are filmed and ready for viewing. Manufacturing Chemists' Assn. **(L-13)**

Plastic stock shapes—New 12-page booklet contains property and application data on mill shapes of nylon, TFE fluorocarbons, polycarbonates, etc., from 50 stock locations in U.S. "Industrial Plastics," Polymer Corp. of Pa. **(L-14)**

Industrial fabrics—Complete listing of wide range of fabrics and custom finishing and printing services available for national distribution along with listing of 75 principal industries using various fabrics, available from Fulton Cotton Mills. **(L-15)**

Warp sizing—Bulletin lists and briefly notes uses and features of various liquid emulsions and pastes and lubricant products for cotton slashing, etc. Bulletin No. 2004, Arnold, Hoffman & Co. Inc. **(L-16)**

Rayon applications—In surgical and nonwoven textile products lists advantages over natural products, predicts future applications for rayon nonwovens. New brochure, "Rayon," available from American Viscose Corp. **(L-17)**

Nonionic chemicals—New bulletin describes applications and properties of 37 nonionic surfact active chemicals falling into four major groupings from glycol esters to polyoxyethylene alkylaryl ethers. Bulletin HCC-9-402 available from Hodag Chemical Corp. **(L-18)**

ENGINEERING

Laboratory bulletins—On accelerated wash tests for color fastness, wash-and-wear tests, abrasion tests, and many others; available from Hatch Textile Research, Inc. **(L-19)**

Winding principles—1960 edition of authoritative handbook spells out latest production techniques of winding and unwinding by use of methods such as center shaft winding. "Principles and Practices of Modern Winding," available from Hobbs Mfg. Co. **(L-20)**

Flame spray process—New bulletin provides engineering data on new methods and findings that bear on metallizing processes and self-fluxing alloys. Useful for producing original equipment. Metallizing Engineering Co., Inc., **(L-21)**

Heating, cooling—Bulletin tells of advantages of heating and cooling by means of Dean Panelcoil instead of old-style pipe coil and heavy in-

. . . *Turn to page* 155

What method saves you 17% of steel strapping?

See page 12

CIRCLE 259 ON READER SERVICE CARD

WRINKLE-FREE
CONTINUOUS-ROLL OPERATION

KAY ANTI-WRINKLE SLAT EXPANDER

By guarding your processing line against wrinkling, the Kay Slat Expander:

1. Allows faster, more efficient machine operation
2. Reduces losses through rejection
3. Assures tighter, neater rolls
4. Assures higher-quality printing and closer register

Supplied with wooden slats for use at room temp. and aluminum for use in ovens, to 550°.

Write for a data sheet

KAY MACHINE COMPANY INC.
Expanders and Rollers

130 Paterson Ave., E. Rutherford, N. J., WEbster 3-4641
EXPORT OFFICE: 401 Broadway, New York 13, N. Y.
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USED IN TEXTILE MILLS AROUND THE WORLD

BARBER COLMAN

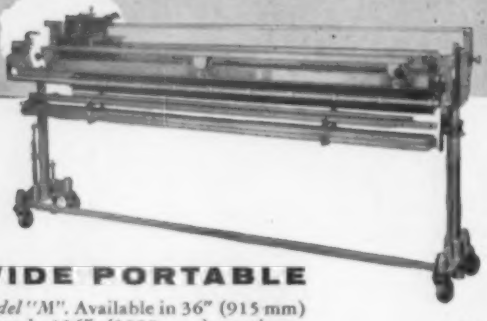
WARP TYING MACHINES

FOR

COTTON • WOOL • LINEN • WORSTED

MOHAIR • SILK • SYNTHETICS

SUITABLE MODELS FOR ALL CONDITIONS



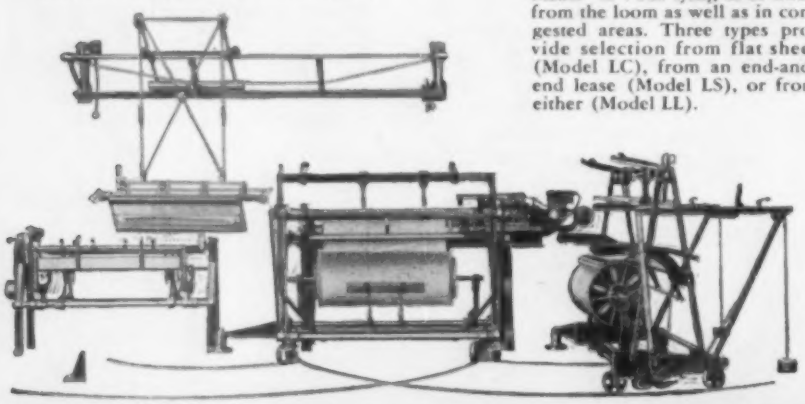
WIDE PORTABLE

Model "M". Available in 36" (915 mm) through 126" (3200 mm) maximum warp width capacity. Multiple frames permit advance loading. Three types provide different methods of selection.

ALL MODELS OPERATE UP TO 325 KNOTS PER MINUTE CONTROLLED BY VARIABLE SPEED MOTOR DRIVE

15" (380 MM) PORTABLE

Model "L". For tying at or away from the loom as well as in congested areas. Three types provide selection from flat sheet (Model LC), from an end-and-end lease (Model LS), or from either (Model LL).



STATIONARY

Model "EL". Designed for use in mills that concentrate on simple weaves. Available in 46" (1170 mm) through 116" (2950 mm) maximum warp width capacity. Tying ahead saves substantial down time at the loom. Selects from flat sheet only. For cotton and spun yarns.

AUTOMATIC SPOOLERS • SUPER-SPEED WARPERS • WARP TYING MACHINES • WARP DRAWING MACHINES

BARBER-COLMAN COMPANY

ROCKFORD • ILLINOIS • U. S. A.

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P. O. Box No. 63
Rio de Janeiro, Brazil

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Do-Yei Shoji Kabushiki Kaisha
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Higashi-ku,
Osaka, Japan

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Piccadilly House
11 Piccadilly,
Manchester 1, England

PAKISTAN
Associated Agencies
(M'cr.) Ltd.
27 Kothari Building
Napier Road
Karachi 1, Pakistan

tegral jacketing. Bulletin M-8, Dean Products, Inc. **(L-22)**

Psychrometric chart—Helps engineers establish relationships between dry bulb temperature, humidity, specific volume, percent saturation, and enthalpy (or total heat content of a mixture). "Ross Psychrometric Chart," J. O. Ross Engineering Div., Midland-Ross Corp. **(L-23)**

Handling problems—Are put in perspective by eight-page, two-color brochure "Standards vs Specials," which describes factors of usage and costs that affect selection of handling equipment. Automatic Transportation Co. **(L-24)**

Industrial lighting—New 52-page booklet describes recent revisions in industrial standards for lighting, specs for aluminum reflectors, and provisions for inspection and tests. "RLM Standard Specifications," RLM Standards Institute, Inc. **(L-25)**

Shipping, warehousing—Special report on efficiency in all phases of shipping and warehousing contains money-saving hints covering all areas. Manpower, Inc. **(L-26)**

ADVERTISERS' LITERATURE

To get items you want, just circle numbers on Reader Service Card next to back cover.

A350—Cord Strapping. For more information or a sample of Avistrap cord strapping Write American Viscose Corp.

A351—Power Transmission. Information on various types, write for Bulletins—
Bulletins 8102-4101 Variable Speed Drives
Bulletin 6100 Card Drive
Bulletin 5103 Flexible Couplings—
T. B. Wood's Sons Co.

A352—Seamless Receptacles. CDF Receptacles catalog contains details on Seamless Snag-Free Receptacles. Continental-Diamond Fibre Co.

A353—Cloth Expanders. Bulletin TEB-58 "Free Wheeling Expander Technical Bulletin" describes solution on expander problems. Mount Hope Machinery Co.

A354—Expanders and Rollers. Data sheet for further details. Kay Machine Co., Inc.

A355—Compressed Air Line Filters. Brochure NA-1 covers line of manual drain and automatic drain filters. C. A. Norgren Co.

A356—V-Belts. Bulletin M-141 for further details. Raybestos-Manhattan Inc.

A357—Acrylic Fiber. Technical Data Bulletin for the facts. Fibers Div., American Cyanamid Co.

A358 — Factoring. Booklet "Profit Through Factoring" gives complete information. Dept TW-6. Walter E. Heller & Co.

A359—Belt Selector Charts. Bulletin 21103 gives information for easy-to-understand all timing Belts. T. B. Wood's Sons Co.

A360—Wash & Wear Fabrics Finishes. Technical data and samples. Plastic Div., Monsanto Chemical Co.

A361—Pneumatic Roll Picker. Free literature for further details. M. B. Products.

A362—Pneumatic Lap Control System. Illustrated brochure for complete details. Livingston & Haven, Inc.

A363—Air Conditioning Units. Bulletin 4A—Humiducts and Bulletin 27A. Easy-Flo Filters contain details. Bahnson Co.

A364—Flat Belts. Literature for further information. Eng'g Dept. J. E. Rhoads & Sons.

A365—Overhead Traveling Cleaner. Bulletin 21A gives useful information. Bahnson Co.

A366—Adjustable Speed Drives. Illustrated literature describes details. Dynamatic Div., Eaton Mfg. Co.

A367—Motor Burnout Protectors. Bulletin PR-1243 gives story on prevention of motor burnouts, Texas Instruments Incorporated, Metals & Controls Div.

A368—Permaglas Storage Units. Bulletin MU-107 gives complete information. A. O. Smith Corp.

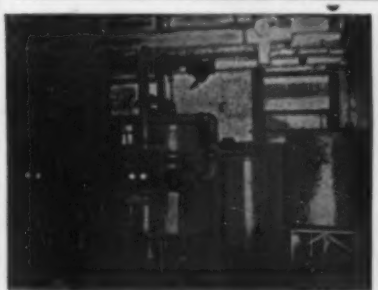
A369—Chain Drives. 88 page Book 2425 has full details on silent chains. Link-Belt Co.

A370—Yarn Winders. Bulletin A-95-A gives details on "Greater-Taper" Cone. Foster Machine Co.

What method saves you **17%** of steel strapping?

See page 12

CIRCLE 260 ON READER SERVICE CARD



IVERSAND WATER SOFTENER PLANT
producing
CLEAR IRON-FREE 100% SOFT WATER
Often For As Little As 1¢ per 1000 Gallons

Troubled with harshness, poor finish, uneven shades, redyes, seconds, and other product difficulties—?? The secret of uniformity may lie in your water supply. May we check it for you?

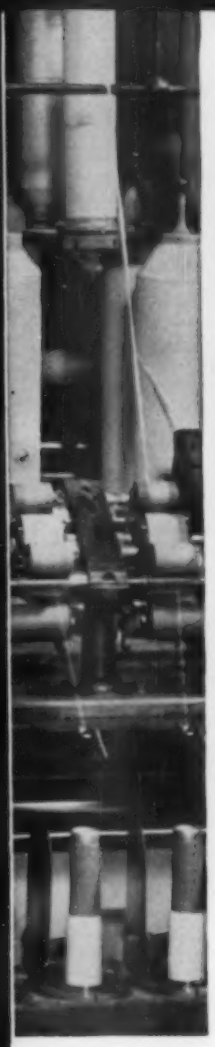
HUNGERFORD & TERRY, INC.
Clayton 9 New Jersey

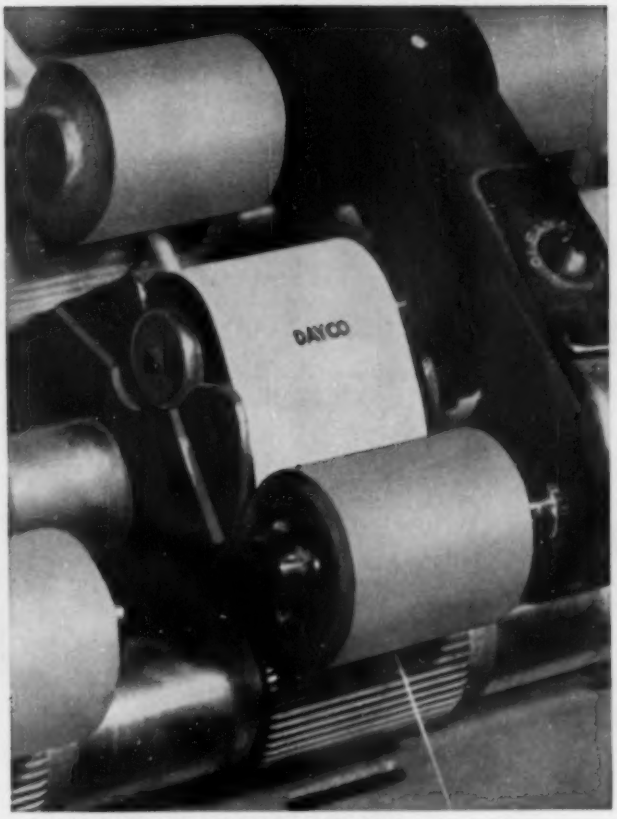
RIGHT FROM THE START UP, you get uniform yarn. No sets, no depressions, no time wasted, no need to turn over a couple of times to iron out. Dayco Aprons and Cots make both speed and quality possible. After week-end shutdowns, Dayco Aprons and Cots immediately deliver top quality yarn with no long line of ends down. Fibers just don't stick to Dayco Aprons and Cots, natural fibers with gummy oils don't affect them, temperature and humidity can't bother them.

GET 12% BETTER YARN . .

"UPS OUTPUT of strong uniform finer quality yarn" reports the overseer after a day with Dayco Aprons and Cots. Dayco's got just the right surface friction to leave the larger fibers in the yarn, not on the clearer board. You can count on Dayco Aprons and Cots when you want to count important extra yardage . . . better yarn . . . more full bobbins . . . at the end of the shift.

DAYCO'S EXCLUSIVE EMBOSSED DESIGN keeps the shaft clean, cuts your apron drag 50%, prevents tucking and eliminates waste-collecting. No sign of apron chatter, either.





DAYCO COTS STAY GOOD AS NEW year after year from buffing to buffing . . . keep all their fine-quality drafting characteristics. Dayco's long-run, top performance makes them the choice in leading mills.

. . . TROUBLE-FREE PERFORMANCE

with Dayco Aprons and Cots, the pair for profits

More yarn . . . better quality yarn . . . more consistency. These are the benefits that explain why Dayco Aprons and Cots are the choice of superintendents and overseers in leading mills everywhere. They are precision-made to exacting tolerances for modern super-drafting, and high yarn uniformity; precision-formulated for longer, trouble-free life. They outlast all others in oxygen-intensified checking tests. Dayco has proven thousands of times in the laboratory and in the mill there is no match for Dayco Aprons and Cots. Throughout their lifetime, they start better . . . stay better longer.

Ask your Dayco Representative to set up a time trial installation with Dayco Aprons and Cots . . . better results guaranteed. Phone or write the Dayton Rubber Co., Textile Division, 401 South Carolina National Bank Bldg., Greenville, South Carolina.

Dayton Rubber

Dayco and Thorobred Textile Products for Better Spinning and Weaving.

OVERSEAS PLANT: THE DAYTON RUBBER COMPANY, LTD., DUNDEE, SCOTLAND

Report of APRON CHECKING COMPARISON TEST MADE IN OZONE CHAMBER

DAYTON RUBBER researchers found Dayco Aprons superior in a comparison test. All apron brands were exposed in an intensified oxygen chamber developing O_3 (ozone).

This test, simulating actual plant conditions in the O_3 chamber converted months to minutes and showed even the leading brands developing the spiderweb checking many "months" sooner than Dayton.

MECHANICAL VS. CHEMICAL— A NEW VIEW ON CHECKING

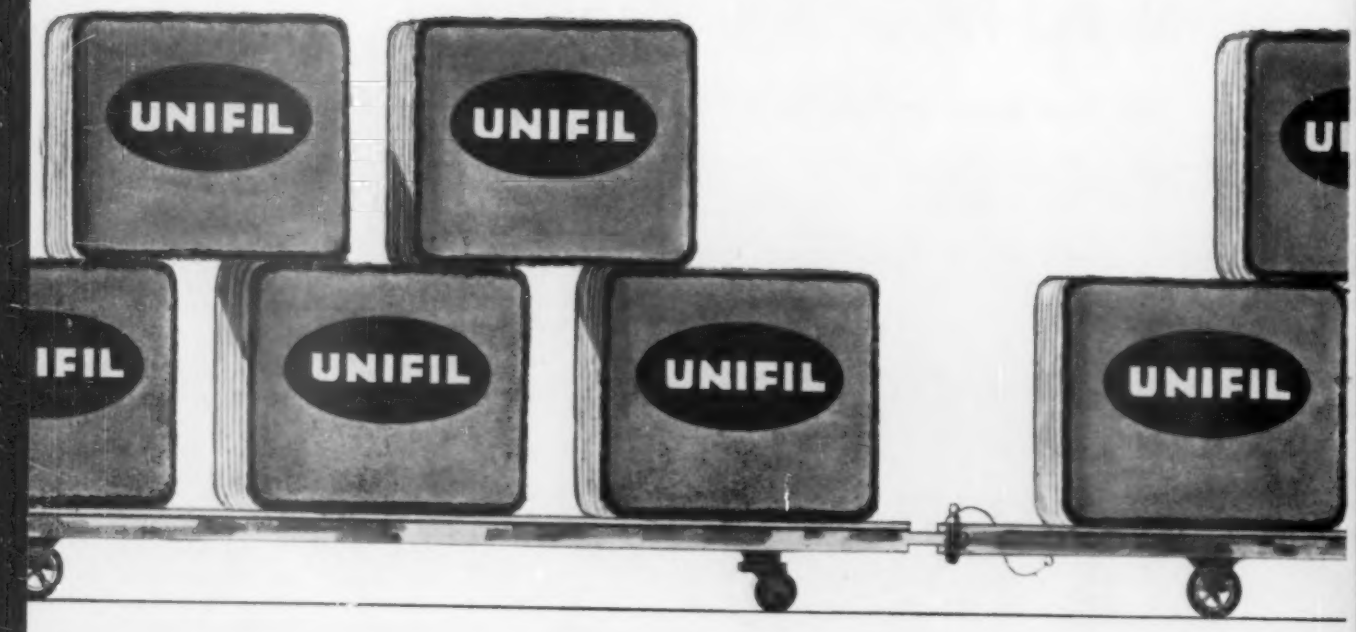
Air conditions in textile plants have changed greatly in recent years. We find greater turbulence of air over the cleaners, a marked increase in number of motors, plus motors of larger size, air conditioning and many other air factors. Yet Dayton laboratory research and field investigation find the checking problem should be studied in terms of mechanical, rather than chemical wear-and-tear. The new sharper angle of the apron and the machines with the new nose bars, the greater demands on machines all suggest research into synthetic compounds instead of the air conditions in the plants. Research into "rat tailing," frictional heat build-up—powerful enough to strip gears—and apron chatter promise sounder answers to apron problems than the negligible amounts of ozone found in the air.

DAYTON ATTACKS BOTH CHECKING CAUSES

Dayton researchers have as a result of this problem reformulated compounds not only to meet *chemical* conditions but also to cope with the newer *mechanical* conditions. Dayton researchers developed formulations for *lower* coefficients of frictions around the new narrow-nose tensors, yet more exacting coefficients on the apron surface for smoother more uniform yarn.

CIRCLE 157 ON READER SERVICE CARD

Thousands On Their Way ...Helping Mills



The outstanding versatility and uniformity that UNIFIL® Loom Winders provide are enabling mills everywhere to enter markets they never even considered before! With cotton, synthetic or textured yarns, progressive mills are producing fabrics in an almost limitless variety of hand, patterns, and surface effects. And . . . they're doing it with maximum economy of operation.

Initial step toward wider markets in many of these mills was a comprehensive study of filling yarn preparation methods, using the Leesona "Profit Factor Analysis." This thorough examination of methods and equipment carried out by Leesona Engineers showed precisely how UNIFIL Loom Winders could increase the scope of weaving operations as well as reduce production costs and improve quality. Very often analysis results proved conservative compared to actual performance. Most mills *reordered*.

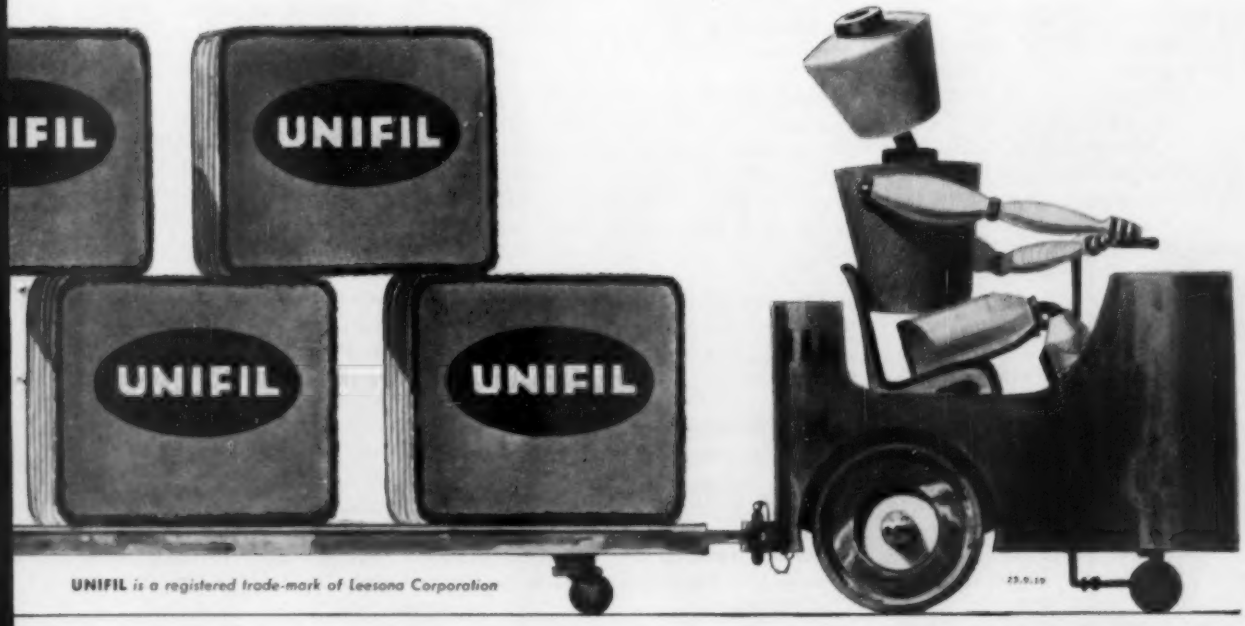
UNIFIL Loom Winders can provide all the advantages of weaving-from-the-cone in *your* mill — by bringing the entire process of filling yarn preparation to the loom. They'll greatly improve the quality of fabrics woven from fine yarns . . . give fabrics with textured yarn filling a uniformity not possible before. Let a "Profit Factor Analysis" show you how UNIFIL can help your weaving operations. Ask your Leesona Sales Engineer in Boston, Philadelphia, Charlotte, Atlanta, or Los Angeles. In Canada: Montreal or Hamilton. Or write Leesona Corporation, P. O. Box 1605, Providence 1, Rhode Island.

Here are just a few of many modern mills which are saving with UNIFIL Loom Winders:

J. P. STEVENS & CO., INC.
BURLINGTON INDUSTRIES, INC.
PONEMAH MILLS
DRAYTON MILLS, INC.
JUDSON MILLS
UNITED MERCHANTS & MFRS. INC.
GLEN RAVEN SILK MILLS, INC.
EXPOSITION COTTON MILLS
GREENWOOD MILLS
FRANK IX & SONS, INC.
MARION MFG. COMPANY
WILLIAM SKINNER & SONS
STRASBURG TEXTILE MILLS, INC.
RICHARD TEXTILES
CADILLAC TEXTILES, INC.
AMEROTRON CORPORATION
SPARTAN MILLS
WOODSIDE MILLS
WAUMBEC MILLS
CANADIAN CELANESE, LTD.
CHRYSLER MILLS, INC.
CONSOLIDATED TEXTILES
KALCO WEAVING CORP.
MARVEN LOOMS
PAXON FABRICS CORP.
PANSY WEAVING MILLS
PEPPERTON COTTON MILLS
RIVERSIDE MILLS
STANWOOD MILLS, INC.
STARR MILLS CORP.

LEESONA

Expand Markets



UNIFIL *is a registered trade-mark of Leesona Corporation*

CIRCLE 159 ON READER SERVICE CARD

Bernson Silk Mills, Inc., New York, N. Y., has been elected an associate member of the Textile Distributors Institute, Inc.

Belknap-Sulloway Mills, Laconia, N. H., has been awarded the certified launderable seal of the American Institute of Laundering for its men's white wool sport socks.

Bigelow-Sanford Carpet Co., Thompsonville, Conn., is changing its name to Bigelow-Sanford, Inc. The new name more clearly reflects the company's diversified interests, Lowell P. Weicker, president, told the stockholders at the annual meeting.

Boontex Fabrics Corp., New York, N. Y., has moved to Manchester, N. H., and has leased space in the former Gera Corp.'s building. The company has placed an initial order for 100 Unifil loom winders which will be used in the Manchester plant.

Burlington Industries, Inc., Greensboro, N. C., is reported to be ready to announce a $6-million new mill that will be built in Cheraw, S. C. According to reports, the new plant will continue the same line of production that is now being done at the company's Cheraw Weaving Mill, Inc. The company has also announced that its division, Burlington Hosiery Co., has opened its new research center at Burlington, N. C.

Cabin Crafts, Inc., Dalton, Ga., is building a third addition to its Springdale plant in Dalton. The new, 235,000-sq.-ft. addition will be used to house existing operations and to allow for expanded carpet-tufting facilities.

Dan River Mills, Inc., Danville, Va., has bought Sayles Biltmore Bleacheries near Asheville, N. C. Joseph P. Quinn, executive vice president of the bleachery, will continue to direct the operations of the plant. Dan River has also announced that the Dan River International Corp. has opened its first foreign office in London, England.

Erwin Mills, Inc., Durham, N. C., has announced that the board of directors has approved capital expenditures totalling $4-million for the fiscal years of 1960 and 1961. The company announced that a large part of the expenditures will be used for the completion of equipment modernization in the spinning departments and in the company's dyeing and finishing plant. Cloth-room facilities will also be modernized at the company's plant at Cooleemee, N. C.

Hanes Hosiery Mills Co., Winston-Salem, N. C., has installed production machinery in its new 700,-000-sq.-ft. plant in Winston-Salem. The new plant is called the Weeks Div. The company's present plant on Ivy Ave. in Winston-Salem has been named the Winston Div.

Inman Mills, Inc., Inman, S. C., has announced that its new $3-million plant at Inman is now producing at 15% of full-scale operation. The new plant is expected to be operating at full capacity early this fall.

Jefferson Woolen Mills, Knoxville, Tenn., has reopened under new ownership. The mill has been closed since March 10.

Perth Knitting Mill Ltd., Perth, Ont., is a newly organized textile mill. It will produce men's dress hose.

Martin Processing Co., Inc., Martinsville, Va., has started building a $250,000 plant.

Mt. Holly Textile Co., Inc., Mt. Holly, N. J., has been bought by Duratex Mills, Groveville, N. J., for $42,000. Duratex plans extensive alterations at the plant.

Princeton Knitting Mills, Inc., Waterville, Conn., has bought the former Scovill Co. mill in Waterville. The plant contains 220,200 sq. ft.

Rhyne-Houser Mfg. Co., Inc., Cheeryville, N. C., has announced that its stockholders have approved the plan to sell the company's physical assets to Burlington Industries, Inc., in a cash transaction. Rhyne-Houser owns three plants.

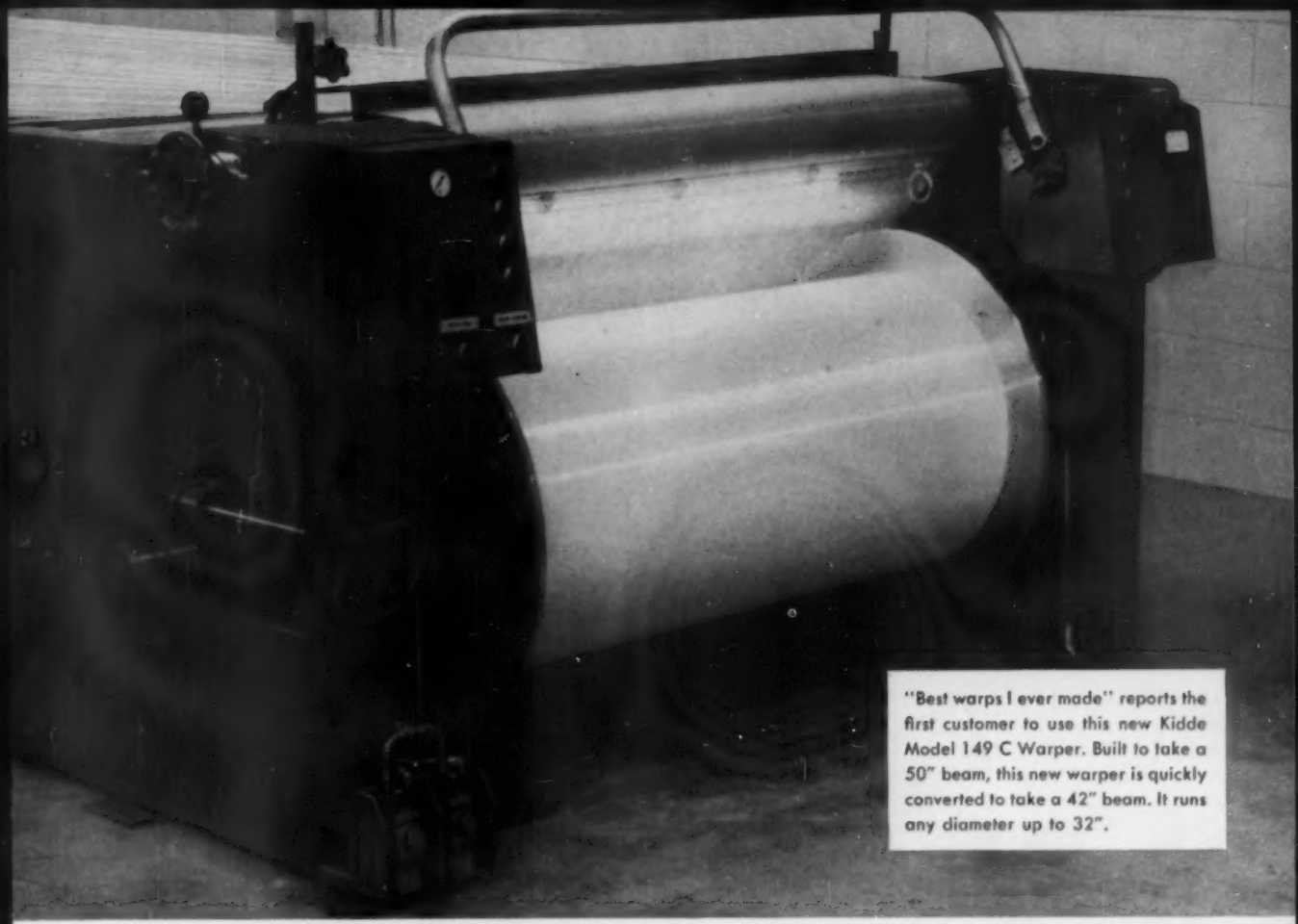
Southbridge Finishing Co., Southbridge, Mass., is starting an expansion program costing more than $2-million.

Springs Cotton Mills, Inc., Lancaster, S. C., has announced a $5-million expansion program. The expansion will ultimately provide employment for an additional 350 people.

J. P. Stevens & Co., Inc., Greenville, S. C., is installing new spinning machinery at its Whitmire, S. C., plant at a cost of over $600,-000.

Stonecutter Mills Corp., Spindale, N. C., and Veriset Association, Inc., New York, N. Y., have signed final contracts to sell and promote a new group of Stonecutter fabrics containing various percentages of Verel under the Veriset program.

The former Wilkes Hosiery Mills Co., North Wilkesboro, N. C., is expected to be taken over by a newly formed knitting and finishing company.



"Best warps I ever made" reports the first customer to use this new Kidde Model 149 C Warper. Built to take a 50" beam, this new warper is quickly converted to take a 42" beam. It runs any diameter up to 32".

Every KIDDE WARPER gives you the smoothest, most even warp beams in the business

Kidde warpers are *engineered* to give you smoothness and evenness in yarn buildup that's unmatched by any other machines you can buy. Here are a couple of reasons why:

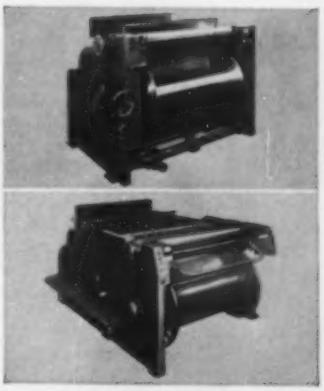
Instead of just one cylinder on the compression roller, Kidde gives you *two* – hydraulically operated – one on either end of the roller, for perfectly balanced pressure that eliminates bounce and chatter. And powerful brakes stop the beam within one revolution and automatically adjust themselves. What's more, the brakes on the measuring roll, compression roller and beam are electronically synchronized so yarn is never scuffed.

When used with a Kidde accumulator, both warper and accumulator are electrically synchronized. This maintains even tension when yarn must be backed off to pick up a lost end.

These are only a few major advantages of Kidde warpers. Get the full story of their trouble-free operation by contacting:

This Kidde warper handles beams up to 21" in diameter, made in three sizes: 21, 42 or 50 inches long. Every part is easily accessible. Regardless of size, any Kidde warper can be doffed automatically – even by a girl. Hydraulics do the work, at the touch of a lever.

Kidde high speed cotton system warper handles 54" section beams with flange diameters up to 36". Has all the quality features of other Kidde warpers with speeds up to 1,000 YPM.



TRICOT AND RASCHEL MACHINES • TRICOT WARPERS • HORIZONTAL WARPERS • BEAMERS
CREELS • SLASHERS • WINDER-REDRAWS • TENSOMETERS • TENSION COMPENSATORS

Kidde

TEXTILE MACHINERY CORPORATION – BLOOMFIELD, NEW JERSEY

The word KIDDE is the trademark of Walter Kidde & Company, Inc., and its affiliated companies.

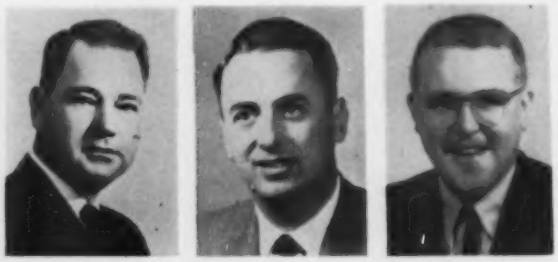
CIRCLE 161 ON READER SERVICE CARD

NEWS ABOUT SUPPLIERS

ALLIANCE TEXTILE MACHINERY CORP., Allentown, Pa.—Is a newly formed company that will buy and sell all types of textile machinery, parts, and supplies. It will also specialize in the purchase and liquidation of complete textile plants. Morton Zelickson, formerly with Republic Textile Equipment Co., New York, N. Y., is president. . . . **ALLIED CHEMICAL CORP.,** New York, N. Y.—Has named F. J. Woods director of sales for the company's General Chemical Div. . . . **ALLIS-CHALMERS MFG. CO.,** Milwaukee, Wis. —Has elected J. D. Greensward president of Canadian Allis-Chalmers Ltd., a wholly owned subsidiary. . . . **AMERICAN CYANAMID CO., FIBERS DIV.,** New York, N. Y.—Has named J. E. Ryan to the newly created post of district manager of New York sales. . . . **AMERICAN LAVA CORP.,** Chattanooga, Tenn.—Plans to build a new technical ceramics plant at Laurens, S. C.

CONTAINER CORP. OF AMERICA, Chicago, Ill.—Has named W. M. Dixon, president of the corporation, chairman and chief executive officer. He succeeds the late W. P. Paepcke. L. H. Schoenhofen, senior vice president, has been elected a director. . . . **CORNING GLASS WORKS,** Corning, N. Y. —Has named E. H. Loytty a product specialist for the company's textile equipment. C. A. Esposito has been named a product specialist for the company's heat exchangers. . . . **DOW CHEMICAL CO.,** Williamsburg, Va.—Has transferred Leon Seidel, customer-service representative for the company's fibers-sales department, to the company's New York City office as merchandise manager for filament products. . . . **DOW CORNING CORP.,** Midland, Mich.—Has named I. W. Hutchison, manager of the international department of the company, has been named president of its new subsidiary, Dow Corning International S. A.

JOSEPH HALFORD (left) has joined Stein Hall & Co., Inc., New York, N. Y., as a sales technician to the textile industry with headquarters in Charlotte, N. C. W. R. FILES (center) has been appointed manager of the Southeastern-division office for Ludell Mfg. Co., Milwaukee, Wis. G. R. TURNER (right) has been appointed manager of textile sales for the Textile Div., United States Testing Co., Inc., Hoboken, N. J.



JOEL R. SHATTLES (left) has been transferred to the Florida and southern-Georgia sales territory for The Fairbanks Co, Rome, Ga. PHILIP M. DIXON (center) has been named branch manager of the Detroit, Mich., office of Peerless Pump, Hydrodynamics Div., Food Machinery & Chemical Corp., Los Angeles, Calif. G. L. BRYSON, JR., (right) has been named representative for Groton & Knight Co., Worcester, Mass.

AMERICAN SAFETY TABLE CO., Reading, Pa.—Has appointed Merrow Sales Corp., Bala-Cynwyd, Pa., distributor for the Philadelphia and South Jersey areas. . . . **AMERICAN VISCOSE CORP.,** Philadelphia, Pa.—Has elected G. J. Alles vice president. Mr. Alles also has been named general manager of the corporation's Film Div. He replaces the late H. J. Michel. J. H. Saville, Jr., has been named general purchasing agent for the corporation. . . . **ANDERSON MACHINE SHOP.,** Needham Heights, Mass.—Has been licensed by Burlington Industries, Inc., Greensboro, N. C., to manufacture and sell the Pacific coiler. Burlington holds the patent rights on this machine. . . . **LOUIS P. BATSON CO.,** Greenville, S. C.—Has named R. L. Cannada to its sales and engineering staff. His headquarters will be in Greenville.

BORDEN CHEMICAL CO., New York, N. Y.—Has named M. C. Wakefield, Jr., sales manager of the Polyco-Monomer Dept., with headquarters in New York. . . . **CATALIN CORP. OF AMERICA,** New York, N. Y.—Has named Howard Wood sales engineer in its Resin Div. He will cover parts of New England and the Middle-Atlantic states. . . . **CELANESE CORP. OF AMERICA,** New York, N. Y.—Has elected K. C. Loughlin president, succeeding Harold Blancke, who will continue to serve as chairman and chief executive officer. J. R. Kennedy has been elected to the newly created position of Vice President-Financial. The company has also announced that D. O. Robbins has been named assistant district-sales manager for New York. R. R. Leonard and J. A. Plant have been named mill-marketing representatives for Celanese Fibers Co.

DRAPER CORP., Hopedale, Mass.—Has named W. E. Turner assistant divisional manager. His headquarters will be in Spartanburg, N. C. . . . **FULLER CO., DRACCO DIV.,** Cleveland, Ohio—Has named R. T. Pring to the newly created post of manager for dust-collector sales. . . . **E. I. DU PONT DE NEMOURS & CO., INC.,** Wilmington, Del.—Has started commercial production of Dacron fiber at its Old Hickory, Tenn., plant. . . . **FOOD MACHINERY & CHEMICAL CORP.,** New York, N. Y.—Has announced that full-scale testing facilities for chemicals used in textile and other applications are now in operation at the Chemical Div.'s research and development center at Princeton, N. J. The company has also announced that G. A. Farno has been named sales manager for chemicals in its Chemical & Plastics Div. W. J. Blair has been appointed vertical-pump product-sales manager, Peerless Pump, Hydrodynamics Div.

B. F. GOODRICH CO., Akron, Ohio—Has named H. B. Warner president of B. F. Goodrich Chemical Co., Cleveland, Ohio. . . . **GENERAL ANILINE & FILM CORP.,** New York, N. Y.—Has promoted Jeal Sugarman to the position of field-sales representative of Antara Chemicals, a sales division. He will assume sales responsibilities for northern and western Texas and Oklahoma. . . . **WALTER E. HELLER & CO.,** Chicago, Ill.—Has promoted R. E. Coffery to the newly created post of general sales manager. . . . **HERCULES POWDER CO.,** Wilmington, Del.—Has elected A. F. Brown, who had been president of Imperial Color Chemical & Paper Corp., to the board of directors. He will be general manager of Hercules's recently acquired operating department known

Shamrock No. 19 Trucks with "Vyntex" Plastic-coated Duck Body.

think of
SHAMROCKS
when you want
RUGGED WEAR ...LONG SERVICE!

. . . Says
"MARK-O-MERIT"®

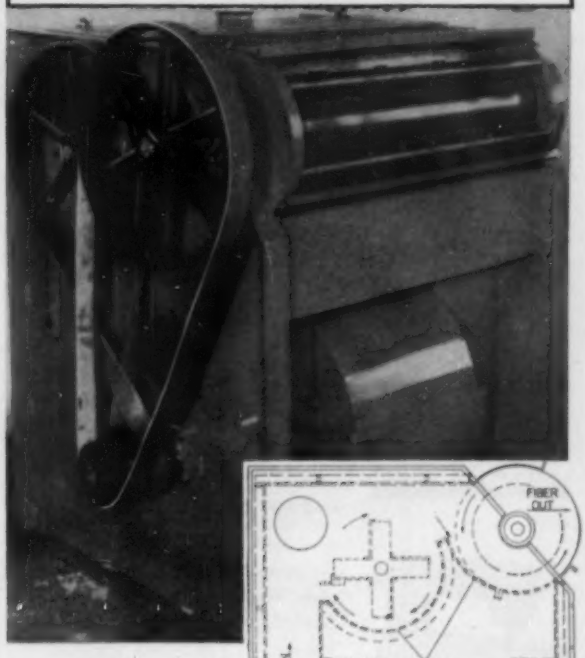
Look carefully at any Shamrock's sturdy construction. You'll see why many textile plants report longer years of wear, at low cost, from famous Shamrock products. Shamrocks are used the world over—and an extensive range of styles is designed for textile plant needs . . . for example, the Shamrock No. 19 "Vyntex" Truck shown at top. Also, special Shamrocks will be made-to-order for your particular needs. Contact nearest sales office or write direct. MEESE, INC., Madison, Indiana.

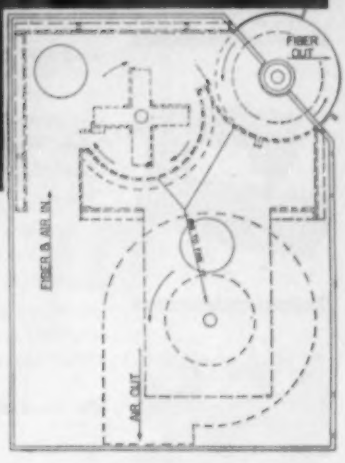
SALES OFFICES: NEW YORK—F. R. Tyroler, 55 West 42nd St. PE 6-0615; ATLANTA—W. E. Petway, 723 East Densley Drive, North Decatur, Ga., ME 6-3192; FORT WORTH—V. M. Hooton, 4220 Normandy Road, Tel. Jefferson 6-6565; WEST COAST—Gene Daniels Sales Co., P. O. Box 846, La Puente, Calif., YOrktown 4-1111. Export Mgr.—R. A. Auerbach, Easton, Pa. Cable Address: "Natly."

SHAMROCK
- *HAMPERS*
- *CANVAS BASKETS*
- *TRUCKS*

CIRCLE 263 ON READER SERVICE CARD

FIBER CONTROLS FC-83
SCREENLESS CONDENSER
HEAVY DUTY—HIGH PRODUCTION SELF-CLEANING CONDENSER





Model FC-83 SCREENLESS CONDENSER, made for Heavy Duty & High Production, has proven itself in efficiency & capacity production.

Will handle up to 2000 pounds of fiber per hour through ducts approximately 200 feet in distance.

It contains 2 Doffer Blades and 2 Separator Plates and a 16 inch self-contained Fan with 24 inch diameter.

It will discharge fiber without:

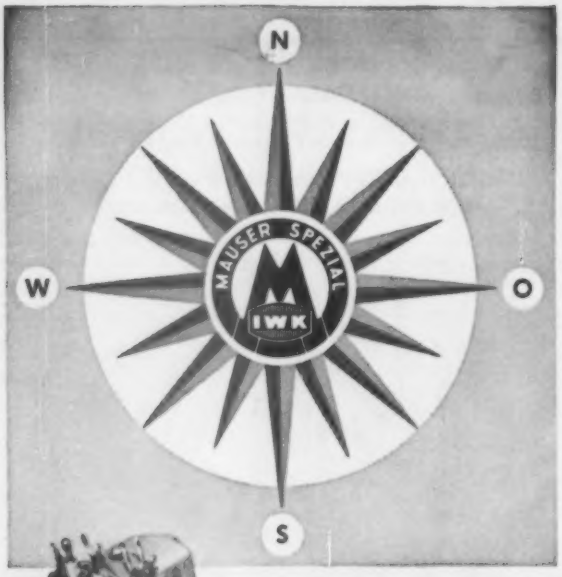
—Tumbling
—Rolling or
—Pilling.

Inquiries about more complete details of this equipment. Call or write:

U. S. Sales Agents:
PARROTT and BALLENTINE, Inc.
3440 Augusta Road, Greenville, S. C.

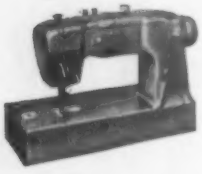
FIBER CONTROLS CORPORATION
BOX 1510 GASTONIA, NORTH CAROLINA

CIRCLE 163 ON READER SERVICE CARD



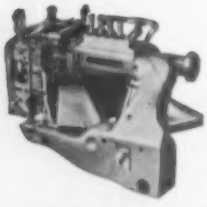
Mauser-Special

Industrial Sewing Machines



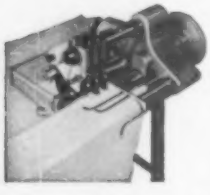
owe their international reputation to the precision of all their component parts, as well as to their most accurate assemblage and extremely precise adjustment.

A complete line of various types are manufactured. They are used for all appropriate purposes by manufacturers of hosiery and knit goods as well as clothing, woven goods, blankets and similar materials.



Our manufacturing program includes:

Overlock Machines
Single Chainstitch Machines
Double Chainstitch Machines
Machines for Sewing Elastics
Border-Attaching Machines
Band-Attaching Machines
Bag Sewing Machines
Cylinder Machines
Feed-off-the-arm Seam-Felling Machines
Flat-Seam Machines
Ribbon Cutting Machines



Leaflets are available on application

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Aktiengesellschaft · Karlsruhe

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as the Imperial Color Chemical & Paper Dept.

HEYDEN NEWPORT CHEMICAL CORP., New York, N. Y.—Has named T. H. Risch field-sales manager and G. T. Roberts product-sales manager for the Heyden Chemical Div. . . . **HUBSHMAN FACTORS,** New York, N. Y.—Has named T. E. Lawrence assistant vice president. His duties will be that of account executive servicing the textile and allied industries. . . . **JOHNS-MANVILLE SALES CORP.,** Toledo, Ohio—Has promoted R. G. Cox to regional sales manager for glass fiber in the Southeastern states. His headquarters will be in Atlanta, Ga. . . . **JOHNSON MOTOR LINES, INC.,** Charlotte, N. C.—Has been granted temporary authority to render intrastate motor freight service heretofore rendered by Cooper Motor Lines, Inc. . . . **MINNEAPOLIS-HONEYWELL REGULATOR CO., DATAMATIC DIV.,** Philadelphia, Pa.—Has named H. F. Mitchell, Jr., to the newly created post of regional systems-sales manager with headquarters in New York City.

JOSEPH A. WIENDL (left) has been named sales manager for Ingersoll-Rand Co., New York, N. Y. HARRY B. BARTLEY, JR. (center) has been appointed field-sales manager of Celenese Chemical Co., New York, N. Y. LLOYD E. FRANKLIN, JR., (right) has been named sales-and-development representative for Air Reduction Chemical Co., New York, N. Y.

MITCHELL SPECIALTY DIV. OF NOVO SPECIALTY CORP., (FORMERLY INDUSTRIAL ENTERPRISES, INC.), Philadelphia, Pa.—Has named Applied Engineering Co., Inc., Orangeburg, S. C., sales representatives in the Carolinas and Georgia for NoVo metering and mixing systems used with reactive resins. . . . **MONTECATINI,** Terni, Italy—Has announced that it is now commercially producing Meraklon isotactic polypropylene staple fiber at its new 12-million lb. per year plant. The company's representative in the United States is Chemore Corp., New York, N. Y. . . . **NATIONAL RING TRAVELER CO.,** Pawtucket, R. I.—Has been bought by the Salmanson family, owner of the Adams drug-store chain. . . . **NOPCO CHEMICAL CO.,** Newark, N. J.—Has announced that its wholly owned subsidiary, Nopco Chimie, S. A., Fribourg, Switzerland, has acquired half interest in the French chemical firm, Doittau-Sopura, S. A.

ONYX CHEMICAL CORP., Jersey City, N. J.—Has announced that the Onyx Oil & Chemical Co., Jersey City, has merged with it. . . . **PARKER-HANNIFIN CORP.,** Cleveland, Ohio—Has named Livingston & Haven, Inc., Charleston, S. C., a distributor for Parker industrial tube and hose fittings. . . . **SACO-LOWELL SHOPS,** Boston, Mass.—Has announced that D. F. Edwards has returned to the company as chairman of its board of directors. The company has also announced that W. F. Lowell, Jr., has been promoted to vice president and assistant general manager of the Saco-Lowell International Div. . . . **TEXIZE CHEMICALS, INC.,** Greenville, S. C.—Is completing the enlargement of its facilities in Greenville. . . . **UNION BAG-CAMP PAPER CORP.,** Jersey City, N. J.—Has announced that stockholders have approved a proposal to buy River Raisin Paper Co., Monroe, Mich. . . . **VERONA DYESTUFFS,** Union, N. J.—Has named B. R. Celentano representative in the eastern section of North Carolina. . . . **WATSON-WILLIAMS MFG. CO.,** Millbury, Mass.—Is moving to Pinebluff, N. C. . . . **WESTINGHOUSE ELECTRIC CORP.,** Pittsburgh, Pa.—Has named P. T. Lagrone vice president in charge of the company's Southeastern region with headquarters in Atlanta, Ga.

NEWS ABOUT MEN

Joseph J. Alerdice has been elected a director of Fruit of the Loom, Inc., Providence, R. I.

Claude D. Arnaud, plant manager at Greenville Finishing Corp., Greenville, R. I., becomes general manager of the Greenville plant and of Taunton Dye & Print Works, Taunton, Mass.

William Astle has been named general manager of the Woodstock, Ontario, plant of Firestone Textiles Ltd., succeeding Frank A. Austin who is retiring.

Leon Atkind has bought out Stephen Schmidt's interest in Bonnie Lass Knitting Mills, Inc., Clifton, N. J., and is now president.

Maurice Atwell, Jr., has been promoted to the position of plant production-control manager at Monarch Mills, Union, S. C.

Robert E. Bailey has been promoted to overseer of compounding, dyeing, and finishing at Callaway Mills Co., La Grange, Ga.

Hastings W. Baker has been elected treasurer of Beaunit Mills, New York, N. Y.

J. M. Cheatham, president of Dundee Mills, Inc., of Griffin, Ga., has been elevated to the presidency of ACMI after serving for the past year as first vice president.

Earl L. Clifford has been elected a director of Fruit of the Loom, Inc., Providence, R. I.

Robert F. Cooper, president of Cooper's, Inc., Kenosha, Wis., has been elected president of the Underwear Institute, New York, N. Y.

HAROLD GRAY HENCKEN has been appointed director of the Engineering & Research Div., American Felt Co., New York, N. Y.

William F. Deuschle has been appointed division plant manager of the new Weeks Div., Hanes Hosiery Mills Co., Winston-Salem, N. C.

Charles R. DeYoung has retired from the Victor Plant, J. P. Stevens & Co., Inc., Greer, S. C., after 35 years of service.

Joseph L. Eastwick has been elected to the board of directors of Burlington Industries, Inc., Burlington, N. C.

James Edgar is retiring as head wool buyer for J. P. Stevens & Co., Inc., after 15 years in that position.

Edward W. Edge has been promoted from trainee to plant engineer for Callaway Mills Co., LaGrange, Ga.

Lenore Friedman has been appointed fashion coordinator for Princeton

ABBOTT MACHINE CO., Inc.

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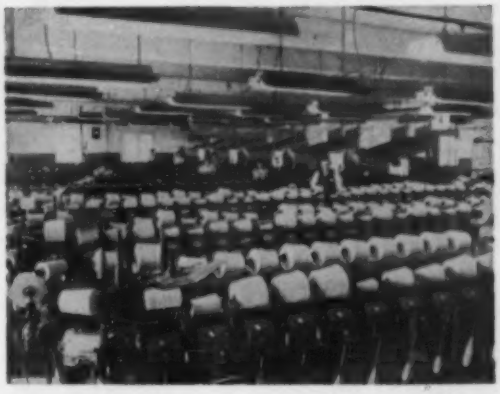

AUTOMATIC CONE OR TUBE WINDERS—for winding all types of spun yarns on cones or tubes for Warping, Dyeing, Twisting, Quilling, Knitting or Sales Packages.

SPECIAL WINDING UNITS FOR KNITTING CONES—include a new slub catcher and a new waxing attachment, which uses standard size commercial wax disks.

LARGE PACKAGES—can be wound up to 11½ inches in diameter for use on shuttleless looms and looms that require a cone supply.

MODEL I AUTOMATIC QUILLER—for coarse count cotton, worsted, wool and other spun yarns, delivers full loom bobbins automatically into boxes, onto pinboards, on wide belt conveyor for inspection of bobbins, or into specially made magazines for automatic loom feeder.

MODEL II HIGH SPEED AUTOMATIC QUILLER (10,000 R.P.M.)—for winding fine count cotton and synthetic yarns of either spun or filament construction.

Also delivers full loom bobbins automatically into boxes, onto pinboards or wide belt conveyor for inspection of bobbins.

Under some conditions one operator can run two or three machines and produce upwards of 2500 full loom bobbins per hour.

ABBOTT FULLY AUTOMATIC RADIAL QUILLER, MODEL II—especially designed for flexibility, is very versatile and particularly well adapted for winding numerous small lots of filling.

Winds coarse or fine count cotton, worsted, wool, rubber and various synthetic yarns, either spun or filament.

Automatic delivery of full loom bobbins onto pinboards, wide belt conveyor for inspection of bobbins, into baskets or other type containers.

Automatic delivery of bobbins can also be supplied whereby full loom bobbins from the individual cones and spindles are delivered into separate containers, which is highly desirable for loom finish yarns and the like.

The Radial Quiller can also be equipped with measured yardage attachments to give accurate, uniform bobbin yardage, as required for two-shuttle looms.

A wide range of spindle speeds for approximately 1000 R.P.M. to 10,000 R.P.M. is obtainable.

One operator can run several machines and thus produce up to 2000 loom bobbins, or more, per hour.

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Knitting Mills, Inc., Watertown, Conn.

Gaston Gage, Jr., has been promoted to plant manager of Pacific Mills, Hot Springs, N. C., plant. He had been overseer of yarn at Drakes Branch, Va.

Harold A. Gibbs has been named plant superintendent at the Dunean plant of J. P. Stevens & Co., Inc., Greenville, S. C.

George E. Gilbertson has been appointed president of Mooresville Decorative Fabrics Co., a division of Burlington Industries, New York, N. Y. He succeeds Buell L. Little, who will now devote full time to his duties as executive vice president of Sidney Blumenthal & Co., New York, N. Y.

Frederick F. Hand has been appointed group leader of nonwoven research and development for J. P. Stevens & Co., Inc., New York, N. Y.

Gordon Hendrick, Jr. has been named general manager in charge of plant operations at Southern Woven Label Co., Columbus, N. C.

John M. Henry has been named overseer of carding at Monarch Mills, Union, S. C.

John R. Illingsworth is now board chairman of Greenville Finishing Corp., Greenville, R. I., and Taunton Dye & Print Works, Taunton, Mass. Claude D. Arnaud, plant manager at Greenville becomes general manager of both plants.

Horace C. Jones has been elected to the board of directors of Burlington Industries, Inc., Greensboro, N. C.

STANLEY F. ANDERSON has been placed in charge of manufacturing for the Tufting Div., Downs Carpet Co., Inc., Philadelphia, Pa.

C. B. Mahaffey has been named superintendent of Calumet Plant of Callaway Mills Co., LaGrange, Ga.

John R. Montgomery has assumed the duties of chemist in charge of the laboratory at the North Carolina Finishing Co., Salisbury, N. C.

M. L. Morgan, assistant superintendent of J. P. Stevens's Republic Plants of Great Falls, S. C., has been made superintendent of the company's Industrial Plant, Rock Hill, S. C.

W. J. Richards has been elected vice president of Cannon Mills Co., Kannapolis, N. C.

William Roberts has been named superintendent of Moultrie Cotton Mills, Moultrie, Ga., replacing W. O. Ruffins, retired.

William C. Ross has resigned as general manager of the North Star Woolen Mills Co., Sanford, Me., and has become general manager and vice presi-

dent of Cashmere Corp. of America in Cleveland, Ohio.

John G. Rothell has been named assistant superintendent Union Bleachery, Greenville, S. C.

William H. Ruffin, president of Erwin Mills, Inc., Durham, N. C., has been elected second vice president, American Cotton Manufacturers Institute.

E. B. Shaw has become president of The American Thread Co., New York.

Earl S. Shultz, former fibers engineer, has succeeded Charles M. Kennemore as product manager of the Union-Buffalo Mills, Union, S. C.

C. B. Sitterson has been appointed director of research and development for Appleton Woolen Mills, Appleton, Wis.

Willis H. Slane, Jr., secretary of Slane Hosiery Mills, High Point, N. C., has been elected chairman of the board succeeding Raymond R. Rice.

Textile World

OBITUARY

Jarvis E. Baker, 70, retired hosiery manufacturer and president and treasurer of Baker-Carmack Mills, Inc. Burlington, N. C.

George Baxter Byrd, former superintendent of Woodside Mills, Liberty, S. C.

W. Curtis DeWitt, 46, supervisor of the corduroy department, Union Bleachery, Greenville, S. C.

Spencer B. Hanes, Sr., retired director and vice president of P. H. Hanes Knitting Co., Winston Salem, N. C.

Carl C. Harris, 79, chairman of the board of Rodney Hunt Machine Co., Orange, Mass.

Julius Kaar, 84, president of Julius Kaar Hosiery Mill, Inc., Philadelphia, Pa.

Ernest C. Locke, 91, retired owner of Locke Hosiery Mill, Philadelphia, Pa.

Philip A. Mullins, founder of the Early Bird Mill, Hickory, N. C.

Harry L. Munz, 73, retired president and owner of the old Resolute Knitting Mills, Philadelphia, Pa.

Guy H. Newcomb, 75, retired manager of the dyes and chemical division of E. I. du Pont de Nemours & Co., Philadelphia, Pa.

Walter P. Paepcke, 63, chariman of the board of Container Corp. of America, Chicago, Ill.

Sam M. Peterzell, 46, former vice president in charge of production at Onyx Knitting Mills, Moss Point, Miss.

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Can Short Lengths of Yarn Be Tested Efficiently?

• A large mill recently cut its test lengths of yarn from 120 to 60 yds. in an effort to reduce testing time and waste yarn. Here are the results of the experiment—

By FRANK VOGEL

THERE HAS LONG BEEN A FEELING among some mill men that too much yarn and time are wasted in testing long lengths of cotton yarn for size, strength, and variation. Recently, a large cotton mill decided to check this theory by reducing the length of its reelings from 120 yds. to 60 yds.

Results of these tests, shown in the accompanying table, tend to indicate that coefficient of variation for all lea strengths is lower in the 120-yd. lengths. In this instance, the mill decided to continue testing the longer lengths. However, under other circumstances it may be possible to make substantial savings in time and waste by testing shorter lengths.

Here's how the test was run:

A 60-yd. and 120-yd. length of yarn was taken from each of 25 spinning bobbins containing 55s, 95s, and 105s single-ply yarn. Sizing and strength tests were made in the usual way.

Variation was calculated from this:

$$\text{Percent variation} = \frac{\text{Range}}{\text{Average size}}$$

Coefficient of variation was calculated from this formula:

$$\text{CV} = \frac{\text{Standard deviation}}{\text{Arithmetic mean}}$$

SUMMARY OF COTTON-YARN SIZING TESTS

Yarn number	Yarns tested	Average size	Range	Percent variation	Standard deviation	Coefficient of variation	Average lea strength	Range	Percent variation	Standard deviation	Coefficient of variation
55s	60	58.56	8	14	1.65	0.028	29.52	14	47	3.12	0.106
55s	120	55.32	7	13	1.69	0.031	34.72	10	29	2.64	0.076
95s	60	92.52	14	15	3.61	0.039	21.76	8	37	2.35	0.108
95s	120	94.36	14	15	3.22	0.034	22.40	7	32	2.08	0.093
105s	60	104.72	13	12	3.28	0.031	21.28	6	28	2.21	0.104
105s	120	103.44	9	9	2.42	0.023	21.56	5	23	1.42	0.066

STANDARD DEVIATION AND PERCENT VARIATION for all lea strengths are lower for the 120-yd. lengths of yarn. There is no special pattern for yarn sizes.

Qualitester
the first real yarn evaluator
The „QUALITESTER" is an electronic yarn testing machine with various functions:- It will automatically count all neps, seeds, spinning faults, fly and other yarn faults, classifying them into 4 different groups, according to size. The fault can be removed if necessary, for visual inspection. Complete cops or bobbins can be tested for regularity, which is recorded diagrammatically. The variable speed winding frame can test up to a maximum of 5.700 metres of yarn per minute, and the yarn can afterwards be used for production purposes. There is a use for the „QUALITESTER" in various Mill Departments, as follows:
Spinning : as a control on the operative and spinning frame, and also on the maintenance and cleaning schemes, the quality of the raw material and the yarn regularity.
Winding : For the correct determination of an economic end breakage rate and for the degree of clearing required. It simplifies the assessment of piece rates, and helps to give a more accurate plan of production.
Weaving : ideal for checking bought yarn supplies, giving a continuous control for consistent yarn quality. Helps in assessing yarn weavability.
The „QUALITESTER" consists of a 6-spindle winding frame, 6 detectors and counting units, and a recorder. „QUALITEX" Electronic slubcatchers, already well known for a number of years, are now available in a miniature form suitable for practically every type of winding frame. They can be fitted without having to make any major alterations to the machine. Your enquiries are welcomed and a demonstration will be gladly given without obligation.
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1—RH Stainless Washer, 2 compt, 84"
1—Coating Unit, Michigan Gas Oven 30'—1952
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12—C&K Big S6 Looms, 60", 4x1—1951
14—C&K W3, Convert Looms, 72" wide—1947
12—C&K W3, Convert Looms, 64" wide ext shafts—1939
13—C&K Rug Looms, Jacquard, 50" wide
3—Single Shuttle Rag Looms, 34" wide
8—Halton Jacquards, Fine Index, 1304 dble lift
1—Universal Roto-Coner, 120 spdls, 6" cast iron, wax attach—1953
1—Universal Roto-Coner, Paper Cone, 40 spdl., cast iron—1948
12—N.E. Butt Braiders—5 carriers—1958
12—N.E. Butt Braiders—3 carriers—1956
1—P & W Davidson Shear, 66½"—age, 1947
4—H & B Spin Frames, 200 spdls, 4½" ga. up to 6" staple, pneumafil—1947
8—P & S Auto Feeders, Model K, 72"—1953

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POSITIONS VACANT

Progressive Tricot Plant in Canada requires for their new Dyeing And Finishing Dept. Manager-Dyer to take charge of whole operation. Excellent position for man with right qualifications. Reply P-4368, Textile World.

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10—Del. Saco-Lowell Draw., 1948, 4 del. frames
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2—Universal #44 Rote Cleaners, steel cams
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1—Cocker 7-can slasher, 30" SS cans
80—Draper 40" XD looms, excel. cond., dobby
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20—D & B 40" Cotton Cards
1—Foster #102 winder, 100 spindles, 50 for paper cones and 50 for tubes
32—C&K 56" S.S looms, M.D., W/Dobby
1—P & W 3-blade Shear Complete
1—Barber Colman 56" LL Knotter
1—Knowles, 1953, Drum Type H.S. Dresser W/Creel, 96"
1—P C W 72" x 36" Semi Decater, 1947
2—Collins Fancy Twisters, 200 spdls.
15—Spindles Whitin Schweiter Winder
2—Scutchers 72" and 78" complete
Nash Pumps sizes, 1-2-3-4-5-6
4—Whitin "B" Fancy Twisters, 4" gauge, 200 spindles, M.D.
2—Tolhurst 60" S.S. Extractors
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SEARCHLIGHT:			400	401	402	403	404	405	406	407	408	409	410	411	412	413	414
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EQUIPMENT AND SUPPLY NEWS:				E1		E2		E3	E4		E5		E6		E7	E8	E9
E10	E11		E12	E13	E14		E15	E16	E17	E18		E19	E20	E21		E22	E23
E24	E25		E26	E27	E28		E29	E30	E31	E32		E33	E34	E35		E36	E37
E38	E39		E40	E41	E42		E43	E44	E45	E46		E47	E48	E49		E50	E51
E52	E53		E54	E55	E56		E57	E58	E59	E60		E61	E62	E63		E64	E65
E66	E67		E68	E69	E70		E71	E72	E73	E74		E75	E76	E77		E78	E79
E80	E81		E82														
NEW LITERATURE:				L1	L2		L3	L4	L5	L6		L7	L8	L9		L10	L11
L12	L13		L14	L15	L16		L17	L18	L19	L20		L21	L22	L23		L24	L25
L26	L27		L28	L29	L30		L31	L32	L33	L34		L35	L36	L37		L38	L39
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L54	L55		L56														
ADVERTISERS' LITERATURE:				A350	A351		A352	A353	A354		A355		A356		A357	A358	A359
A360	A361		A362	A363	A364		A365	A366	A367	A368		A369	A370		A371	A372	A373
A374	A375		A376	A377	A378		A379	A380	A381	A382		A383	A384		A385		
REPRINTS:				R1	R2		R3	R4	R5	R6		R7	R8	R9		R10	R11	R12
R13	R14		R15	R16	R17		R18	R19	R20	R21		R22	R23	R24		R25	R26
R27	R28		R29	R30	R31		R32	R33	R34	R35		R36	R37	R38		R39	R40
R41	R42		R43	R44	R45		R46	R47	R48	R49		R50	R51	R52		R53	R54

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ADVERTISEMENTS:				INSIDE FRONT COVER					INSIDE BACK COVER						BACK COVER		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
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E24	E25		E26	E27	E28		E29	E30	E31	E32		E33	E34	E35		E36	E37
E38	E39		E40	E41	E42		E43	E44	E45	E46		E47	E48	E49		E50	E51
E52	E53		E54	E55	E56		E57	E58	E59	E60		E61	E62	E63		E64	E65
E66	E67		E68	E69	E70		E71	E72	E73	E74		E75	E76	E77		E78	E79
E80	E81		E82														
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L12	L13		L14	L15	L16		L17	L18	L19	L20		L21	L22	L23		L24	L25
L26	L27		L28	L29	L30		L31	L32	L33	L34		L35	L36	L37		L38	L39
L40	L41		L42	L43	L44		L45	L46	L47	L48		L49	L50	L51		L52	L53
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A374	A375		A376	A377	A378		A379	A380	A381	A382		A383	A384		A385		
REPRINTS:				R1	R2		R3	R4	R5	R6		R7	R8	R9		R10	R11	R12
R13	R14		R15	R16	R17		R18	R19	R20	R21		R22	R23	R24		R25	R26
R27	R28		R29	R30	R31		R32	R33	R34	R35		R36	R37	R38		R39	R40
R41	R42		R43	R44	R45		R46	R47	R48	R49		R50	R51	R52		R53	R54

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